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ANTHRAX IN THE HORSE AND DOG.*

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WHEN death occurs in the horse, as the result of inoculation with *Bacteridiæ* or the intra-vascular injection of Anthrax blood, it has always for its initial cause the *Bacteridiæ*, though the lesions may vary in different animals. In one instance (that of an old horse) I obtained lesions identical with those which I have described as observed in the rabbit and sheep—that is to say, obliteration of the capillaries; but I also found, in addition to these, an acute inflammation of the intestines and omentum, as well as an acute Peritonitis, with sub-peritoneal sanguineous extravasation and blood suffusion in the parietes of the heart. These lesions, which will be accounted for hereafter, occasioned the greatest suffering, and certainly hastened death by several hours.

A second subject (an old ass), into one of whose labial coronary vessels seven or eight drops of blood had been injected, presented alterations in the connective tissue to a much more serious extent.

* Note presented to the Paris Académie des Sciences, and translated by "R. S. L.," veterinary student, Toulouse.

There were a great number of hæmorrhagic extravasations; all the lymphatics of the intestines—and particularly of the cæcum and colon—were extremely distended; there was sub-acute Peritonitis; the omentum was black, and here and there were blood-clots; there was also intense Pericarditis, and large ecchymoses on the heart. The peritoneal fluid contained immense quantities of *Bacteridiæ*, as likewise did the engorged lymphatics and the glands situated along the course of these; there were literally heaps of them in the connective tissue adjoining the ecchymoses. The blood only contained a small quantity of them, and obliterated capillaries were rare.

In the two instances in which adult dogs were killed by the injection of fifteen drops of rabbit's blood into the saphena vein, the lesions were identical. At the autopsies, the only lesions observed were a not very intense inflammation of the intestines, but extremely grave alterations in the heart. The ventricles and septum were the seat of large ecchymoses, and about one-fifth of the whole of the muscular fibres of the organ had undergone fatty degeneration. In both cases there was sub-acute Pericarditis, with red corpuscles and innumerable very long *Bacteridiæ* in the serum. The latter were only present in small number in the blood.

The principal lesions in the ass and the two dogs were, therefore, inflammation of the vessels and their consecutive rupture. They were equally met with in the sheep and the horse, though in a much less degree.

I have only once, in more than a hundred cases, found numerous and considerable vascular ruptures in the rabbit.

Inoculation, and subcutaneous and intravascular injections of Anthrax blood, did not always, however, give rise to generalised Anthrax. An old ass resisted repeated attempts of this kind. I have also failed with dogs; and I have also not once succeeded in communicating the disease to pigs three to four months old, no matter what means were employed. But if these animals did not die of Anthrax, the local lesions produced were, nevertheless, of the greatest interest, as they throw light upon a property possessed by the *Bacteridiæ* which enables us to explain the inflammatory phenomena observed in various subjects. The local

effects due to these organisms appear to me to result from the presence of a soluble matter (*diastase?*) secreted or excreted by the parasites, and which enjoys to a high degree—though this varies according to the species which nourish the *Bacteridiæ*—phlogogenous properties, well exemplified in the following experiments :—

1. At the inner surface of the thigh of two young pigs I introduced, by punctures, rabbit blood containing *Bacteridiæ*. On the following days there were pustules at the points of inoculation, with swollen and painful inguinal glands, and slight leucocytosis. The pustules contained *Bacteridiæ;* and finishing their course as abscesses, they healed in seven or eight days. The gland remained enlarged, and a month afterwards one of the pigs was killed, and in that structure was found an abscess a portion of the pus in which had already undergone calcareous degeneration.

Another pig, treated in the same manner, was killed thirty hours after inoculation. The inguinal and sub-lumbar lymphatic glands were red and tumefied, but no *Bacteridiæ* were found. Inoculation of a rabbit with the pulp of these glands did not yield any result.

2. An ass proved refractory to two intravenous injections. Several successive subcutaneous injections or inoculations were made with Anthrax blood from a rabbit. Inflammation occurred at the points of inoculation, with peripheral œdema, tumefaction of the glands, and, finally, an abscess which was opened with the bistoury; the pus was of good quality. The same ass had injected into the inner surface of the thigh three drops of Anthrax blood from a sheep. Next day the temperature had risen from 37° to 39° (Cent.); the following day there was considerable and painful œdema, with serious general symptoms and intense shivering; the temperature was 40·1°, pulse 70 and intermittent; there were from ten to fifteen white corpuscles to one hundred of the red, and the blood contained numerous granules.

The urgent symptoms gradually subsided, an abscess formed, and the animal had completely recovered in seven days.

3. With dogs refractory to intravenous injection, I resorted to the same procedure, and constantly produced considerable œdema

with, most frequently, inflammation of the lymphatic glands; in one instance there was an enormous abscess which caused death. With the blood from a dog affected with Anthrax, I have produced in another dog a considerable-sized abscess, which opened spontaneously at the moment when the symptoms were so grave that we thought the animal must have died.

In all these experiments, the blood was injected in a perfectly fresh state. Comparative injections with healthy blood never produced the slightest inflammation.

4. In order to ascertain more exactly the part played by the *Bacteridiæ* and their *excreta*, I had the Anthrax blood filtered, and injected the filtrate. This experiment only led to the production of a slight inflammation, altogether local. The inoculation or injection of *Bacteridiæ*, cultivated according to Pasteur's method, has given rise to the same inflammatory phenomena as the Anthrax blood produces. The difference in the two experiments was due to the fact that the *Bacteridiæ* had lived for a certain *sur place*, and in becoming multiplied had produced a certain quantity of phlogogenous matter.

From the result of these experiments it appears to me that along with these *Bacteridiæ* there exists a substance endowed with intense phlogogenous properties, which should be largely taken into account in interpreting the lesions which are observed in Anthrax. These experiments also demonstrate that the phlogogenous matter is more or less active, according to the subjects from which the *Bacteridiæ* are obtained. The animals which I have studied may be ranked in the following order: rabbit, guineapig, sheep, ass, horse and dog. In this order are disposed the inflammatory lesions of Anthrax and those which are developed by subcutaneous injections in the refractory animals.

SPERMATIC ANEURISM IN AN OX.

BY P. BEATTIE, V.S., BOYFERN, ABERDEENSHIRE.

ON reading Professor Walley's communication on Spermatic Aneurism in the June number of the *Veterinary Journal*, and thinking that a few remarks on a similar case I met with some

time ago may be of interest, I am tempted to send you the particulars.

When at a farm in this neighbourhood, my attention was directed to an ox with a very considerable enlargement of the right side of the scrotum. Surmising, at first sight, that it was a chronic tumour, I was much astonished when, on handling it, I found it to be compressible, and still more so when I very distinctly felt pulsations which corresponded with the arterial pulse. I do not recollect if any vibratory movements were visible.

As the animal was fattening for the butcher, and to all appearance thriving perfectly well, I did not recommend surgical interference, but advised the owner to exercise a little pressure in feeding. This, I believe, was done, and I heard no more of the animal.

NOTE-BOOK CASES.

BY T. HOPKIN, F.R.C.V.S., MANCHESTER.

Supposed Cases of Poisoning.

In April, 1877, a summons came from a large brewery in this city, requesting us to go there immediately, as a number of their horses were down and could not get up. On arrival at the stables we found this statement to be correct; and altogether there were six horses unable to rise, owing to what we diagnosed to be paralysis, due to some strong agent, either administered by the men or taken accidentally with the food. The animals were perspiring freely, and making vain efforts and struggles to regain their feet. All the slings we were able to obtain readily were three pairs, with which we raised three of the six horses; these three ultimately recovered, but the others died in a short time.

The treatment adopted was a dose of purgative medicine, iodide of potassium, iodine liniment to the spine, etc. In June, one of the three horses being old, permission was obtained to destroy it. The autopsy revealed effusion into the spinal canal, with thickening of the membranes of the cord, more particularly at the part where the nerves are given off to the extremities. The other parts were, to all appearance, healthy.

The other two horses were in August working well, but had

to be kept in slings, as they were unable to rise if allowed to lie down. In September, however, they got up and lay down without the slightest difficulty.

The food was carefully examined and analysed, but nothing of a deleterious nature was discovered. It was, however, changed as a matter of precaution, and no more cases of paralysis occurred.

On October 21st, 1877, we were sent for about noon to see a grey cart-gelding, seven years old, at another brewery on the opposite side of the city. It had been at work in the morning, and was, when we saw it, supposed to be suffering from Colic. The pulse was between forty and fifty beats; there was intense perspiration, and the horse was unable to get up. After placing him in slings we found that he was completely paralysed. As there was a considerable degree of exhaustion, a diffusible stimulant was first administered; this was followed by the administration of strychnine, with counter-irritation to the spine, and sloppy mashes for diet. After being in the slings for an hour, the position was changed by placing him on the other side. On the 22nd the posterior extremities were very much swollen, and the horse was exceedingly irritable from not being able to use them. He raised himself on his fore-limbs and struggled violently, the perspiration rolling off him. He died early next morning, but through the carelessness of the owners we were not able to make an examination of the body.

At the same brewery, on November 10th, a brown six-years'-old gelding was attacked in a similar manner, and died next day, in spite of medical treatment. On the same day, another horse—an aged black gelding—was seized about noon, but we fortunately got him under treatment before he was down. He received an aperient and liq. ergot., and stimulants were applied to the spine. He was put in slings, his food was changed, and he ultimately recovered.

We have since seen recorded the account of some analogous cases occurring in Germany, and due to "fungi" on oats, as proved by experiment on an old mare, as well as by a microscopic examination. That the cases we have given were caused by something of this kind, we have no doubt; and we think this

is proved by the fact that, after the first case occurring at the second brewery, the owners were sceptical with regard to the influence of the food in the production of the disease, and continued to use it. But after the second horse was attacked this food was discontinued; and the third case was milder and more amenable to treatment. Six other horses, however, fed on the same food up to the 11th November, showed no symptoms of illness. It might happen, nevertheless, that the fungi, or whatever caused the disease, was unequally distributed in the food.

Cæsarean Section in a Bitch.

In November last, a small fancy toy-terrier pregnant bitch was brought to us to be delivered. She had been served by a dog much larger than herself, and the pup presenting in the genital canal was dead.

The vagina was cold, harsh, and dry; and after examination and deliberation we came to the conclusion that the only chance of saving the life of the poor little creature was by resorting to the Cæsarean operation. After administering chloroform, an incision was made in the left flank, from the middle of the last rib obliquely backwards and downwards, through the walls of the abdomen, exposing the uterus. Through an opening in the left side of this viscus the dead pup was removed, as well as the placental membranes belonging to it. The right side of the uterus was next brought up, and from it two living puppies were extracted. In concluding the operation, a mistake was made in not bringing the cut margins of the uterus together by means of carbolised catgut. The wounds in the abdominal muscles and skin were closed by two sutures, and a bandage, with antiseptic dressings, was applied.

In twenty-four hours the bitch was cheerful and bright, taking food and suckling the puppies. Without our knowledge the bandage was removed, and the animal peevishly objecting to its being re-applied, it was left without anything around the body. During the night a portion of the intestines escaped through the opening, and death ensued. Had it not been for this accident, the bitch would, we believe, have recovered.

The two puppies were living a week after the operation.

PARALYSIS (PARAPLEGIA) AMONG THE ROYAL ARTILLERY HORSES IN THYETMYO, BRITISH BURMAH.

BY W. SARTIN, M.R.C.V.S., ROYAL ARTILLERY.

FOR many years past—in fact, I believe ever since a field battery of artillery has been stationed here—large numbers of horses have annually become incapacitated from work through Paralysis in the hind-quarters. The disease has appeared during every month in the year; but is most prevalent from the beginning of August to the end of December. During this time it frequently disables a large number of horses. It then most probably ceases, with the exception of an isolated case or two, until the next season.

Soon after I came to this place (October 1874), the disease broke out very severely; seven horses were attacked in December, which is a very cold month here. This led me to believe that Paraplegia in this station was identical with the disease known in India as "gone in the loins," which is supposed to be frequently caused by a "stroke of the wind,"—*i.e.*, a cold wind blowing on the exposed back and loins. I regard this disease as Acute Rheumatism of the muscles of the back and loins, or congestion of the coverings of the spinal cord; and if it depends on the former condition, it is frequently curable. Indeed, I recollect two very severe cases recovering in my own practice. Accordingly, in this Burmese malady I applied the usual remedies, but without any success.

There are horses wandering about this station which were bought so long as three years ago by natives, in the hope that time, or some pet nostrum of their own, would effect a cure; but they still continue in the same half-crippled state.

At the request of the late Col. Horne, R.A., I kept six very fine horses for a long time, to see whether a prolonged rest and the hot weather would do them any good, but without a beneficial result being observed; and in the end they were all cast or destroyed.

The theories started to account for this disease have been as numerous as contradictory, and frequently most absurd; indeed,

half the people I have met here with any pretensions to knowing anything about a horse (and who is entirely without this kind of knowledge?), have made startling suggestions as to its origin—commencing with "It might be." I may here mention a few of them. Too much work; want of work; stroke of the wind; being in stables; stables facing the wrong way; too much gram; gram itself, with a suggestion that "paddy" (rice in the husk), or some peculiar bean, be substituted; being blanketed in the cold weather; not being kept warm enough; and, lastly, a worm in the spinal cord; but this turned out to be, on closer inspection, a piece of nerve fibre which had become detached in the *post-mortem* examination. I need scarcely say that none of these explanations appeared to me to be correct; and so matters went on until 1877.

I had often wondered whether the drinking water in the well might be the cause of this most perplexing disease. I could not see any reason why it should be; or, if it were, I did not see any way of getting other of different quality. At the time I speak of, the water in the river was thought by the inhabitants of the place to be much the same as that in the wells. One day I remembered having heard that the river Irawaddy derived its supply principally from the melting of the snows in the mountains whence it has its source; and that gave me a clue to my present theory as to the nature of the disease.

It is well known that, in Thyetmyo, water, if allowed to stand for a few days, deposits an opaque white substance on the sides and bottom of the glass, consisting chiefly of the salts of lime and magnesia. This, I am aware, is a common occurrence; but I have never observed it to such an extent as I have done here,—the water being very alkaline indeed.

I was not able to procure an analysis for some time; but I changed the horses' water on the 1st November, 1877, and since that time nothing but water from the river Irawaddy has been used—which, consisting as it does principally of melted snow, I knew must be very soft and contain but little lime and magnesia. Indeed, the difference between the two waters can be easily perceived by washing one's hands in them. The result has been most satisfactory; for we have only had five new cases

(two early in November and three in February); and of all the horses on the sick list at the end of October, we have not had to destroy one.

The following is a return of the admissions, deaths, and castings, since the disease appeared in July 1877:—

Month.	Admitted.	Destroyed.	Cast.	Remaining.	Month.	Admitted.	Destroyed.	Cast.	Remaining.
July	4	0	0	4	December	0			
August	3				Remaining in Nov.	31			
Remaining in July	4				Total sick	31	0	6	25
Total sick	7	2	0	5	January	0			
September	9				Remaining in Dec.	25			
Remaining in Aug.	5				Total sick	25	0	0	25
Total sick	14	3	2	9	February	3			
October	23				Remaining in Jan.	25			
Remaining in Sept.	9				Total sick	28	0	25	3
Total sick	32	3	0	29	March	0			
November	2				Remaining in Feb.	3			
Remaining in Oct.	29				Total sick	3	0	0	3
Total sick	31	0	0	31					

It will be seen by the above return that when we used the well water, of seven horses sick in August two were destroyed; of fourteen sick in September three were destroyed; and in October of thirty-two sick three were destroyed. I should here remark that they are not destroyed until they fall down and are unable to get up again.

Appended is a copy of an analysis of the well water and river water made by Dr. Sinclair in 1872. I also send a copy of an analysis of the well water made by Dr. King, the Government analyst at Madras, in December 1877.

During the year 1877 the river rose to an unprecedented height, the rainfall was very heavy, and all the country round about was flooded. On measuring the well, it was found to be a foot and a half shallower than formerly; and this may perhaps account to some extent for the discrepancy between the two analyses. It is also worthy of remark that we have

never before had so many cases of Paralysis (viz. forty-one) in one year.

Since January 1871 (before which time there was no veterinary surgeon here), 130 cases of Paralysis have occurred, and I find six cases are reported as having been cured or relieved by my predecessors; but on looking up these cases I notice that they were all cast or destroyed within a short time. I can only say that I have never been able to effect a cure in any one case, and that I regard the disease as being quite incurable. My only object is, therefore, to try and prevent it; for I am quite convinced that if the Paralysis is once fairly established, a cure is impossible.

Symptoms.—The horse staggers about when walked, and appears to have lost control, to a greater or less extent, over his hind extremities. Frequently one leg is much more affected than the other. There is also very great difficulty in turning; and if the horse is turned round sharply, one or both legs will appear to move "all of a piece." This peculiar movement can scarcely be accurately described; but the animal appears to be unable to rotate the femur and flex the hock at the same time. In all cases there is incontinence of urine; and in bad cases in mares the urine is constantly trickling down the thighs, causing sores of a very painful and disgusting character. The urine itself is very much clouded, of a creamy yellow colour; and if allowed to stand for a few hours, deposits a sediment equal to about four-fifths of its bulk. The specific gravity varies from 1040 to 1046, and crystals of the phosphates can be seen in large quantities under the microscope. The specific gravity is about the same in healthy and paralysed horses here; but after the river water had been used for about six weeks, the specific gravity went down from 1030 to 1037 (taken from six horses each time). There are no other constitutional symptoms; the horses feed well and are not apparently in pain, nor do they lose condition. As the disease progresses, the symptoms become aggravated; the horse walks with greater difficulty, until at last he falls down, and when raised is unable to stand. He is then shot.

The disease is, as a rule, gradual in its approach, and many

horses in the battery are slightly affected and continue to do their work; but it is a common occurrence to hear some one say "That horse is going,"—and as a rule he goes.

Treatment.—I usually administer a purgative when the horse is first admitted to the sick lines; and have tried counter-irritation to the loins in various forms—such as hot fomentations, turpentine stupes, blisters of sorts—also applied to the hip joints frequent cataplasms of mustard and ammonia, the skins of freshly-slaughtered animals, etc., and have also used a powerful galvanic battery. Internally, I have given the alkalies—such as iodide of potassium, the bicarbonates of potass and soda, etc. I have also given the vegetable and mineral tonics, including quinine, gentian, arsenic, the sulphates of iron and copper, tinct. ferri sesquichlor., with stimulants such as ammonia and ether. I likewise gave the mineral acids a fair trial, as well as strychnine in gradually increased doses, until tetanic symptoms ensued and the horse was with difficulty brought round again. The phosphate of iron has also been employed: in short, I have ransacked the pharmacopœia, but am, as I said before, unable to find a cure. No medicine will compel nature to reproduce healthy structure in a liver or kidney which has become disorganised, and it is in the minute vessels of these organs that the disease commences.

Post-mortem appearances are much the same in all cases. The following is the result of an examination of the bodies of two horses made very carefully by myself and Dr. Kingston.

Brain.—A large quantity of fluid in the lateral ventricles. Choroid plexus slightly congested, as well as the arachnoid membrane and surface of the brain. The bloodvessels underneath the cerebellum very much congested.

Spinal Cord.—Dura mater healthy. Arachnoid slightly congested. Cerebro-spinal fluid in excessive quantity, and dark-coloured; it contained some flakes of gelatinous-looking matter. The substance of the cord looked healthy.

Kidneys.—Of natural size, pale in colour, and very soft. Pyramidal portion disorganised, and changed to a waxy-looking substance. Under the microscope the uriniferous tubes ex-

hibited signs of fatty degeneration. The bloodvessels reacted with iodine—indicating amyloid degeneration.

Liver.—Also fatty; bloodvessels reacted with iodine, as did those of the kidneys. The other viscera were healthy.

On the spinal cord of one horse there was a small extravasation of blood between the first and second lumbar vertebræ. Otherwise the *post-mortem* appearances were similar in both cases.

In conclusion, I may add that the food is of very fair quality, and the stabling is good. The horses are regularly exercised when not at work. In cold weather they have good blankets, and the disease can be traced to no want of care of any kind. I do not think, either, that the climate can be blamed, as horses become affected in cold and dry as in hot and damp weather, and occasionally in the dry hot weather. It has occurred during every month of the year.

The following are my reasons for attributing the disease to the water:—

1st. The water is worse now than it was formerly, and we have had more cases.

2nd. The decrease in depth of the well, showing that the soil must have silted in from the bottom, and probably accounting for the altered character of the water.

3rd. The steadily increasing number of cases until the end of October, and the severity of these cases necessitating the shooting of several horses before we changed to the river water.

4th. When the water was changed the disease ceased almost entirely, and many of the sick horses became very much better.

I am of opinion that alterations of an obscure character commence in the kidneys. They extend to the other tissues, rapidly causing their disorganisation, and prevent them from performing their proper functions. I have not been able to detect alterations in the brain or spinal cord, because most probably the animal is so badly paralysed as to necessitate his destruction before the disorganisation of these tissues is sufficient to become apparent.

REPORT ON POTABLE WATERS OF THYETYMO. ANALYSED BY DR. SINCLAIR IN 1872.

Date of analysis.	Water source—its position, and by whom used.	Physical properties of the water.	Reaction.	Hardness.			Parts per 100,000 of Water.							Apparent effects of ignition.	Parts per 100,000 of Water.								Gases given off by boiling one litre of water: Oxygen, Hydrogen, and Nitrogen.	Summary of Analysis.
				Total.	Permanent.	Removable.	Of oxygen removed by readily oxidisable matter.	Do removed by oxidisable matters at 60° present.	NH_3 free and combined.	Albuminoid ammonia.	Nitric acid.	Nitrous acid.	Total solids.		Lime, Ca.O.	Magnesia, Mg.O.	Chlorine, Cl.	Sulphuric acid, $Hy.SO_4$.	Phosphoric acid.	Sulphuretted hydrogen.	Silica.		
16.2.72 begin. Current 2 to 3 miles an hour.	Irawaddy, tidal upwards of 150 miles. Sample of water taken about a mile from Thyetymo. 30 feet deep in centre here. No villages of consequence between Thyetymo and frontier, so that water above the town should be pretty safe, though turbid after rains.	Whitish tint; pleasant taste; no smell; slightly turbid; no organised forms.	Alkaline.	2·8	2·1	·7	·01	·18	..	·007	1·11	Present	15·6	loss 2·6	..	..	·21	..	Present.	..	3·1	..	$Ca.CO_3$ = ·65 $Mg.CO_3$ = 2·9 $Mg.SO_4$ = ·5 Presence of nitric and nitrous acids makes this water suspicious.
5.2.72.	Well No. 2.—R.A. lines. 30 yards north of centre stable, and 15 yards east of Infirmary; built brick and cement, also provided with pukka built trough for watering the horses; much less water in hot months, and by men and horses thought good. In sand and gravel.	Clear and transparent; taste agreeable; no smell.	Alkaline.	20·3	4.85	15.3	·008	·09	·003	·007	..	..	46	loss 9·6	..	..	4·26	..	do.	..	1·82	..	$Ca.CO_3$ = 9·1 $Mg.CO_3$ = 8·3 $Ca.SO_4$ = 8·9 $Mg.SO_4$ = 2·2

Copy of an analysis of the water in the well R.A. horse lines made by the Government analyst at Madras, 13th December, 1877:—

	Grammes per litre.
Total solids	0·780
Volatile do.	0·200
Sodium chloride	0·075
Total hardness	15·8°
Permanent do.	12·0°
	Mgrammes. per litre.
Free ammonia	0·06
Albuminoid do.	0.16
Nitric acid	18·0

Remarks.—Vegetable *débris,* with some microscopic animal organisms, in the sediment. The amounts of volatile solids, of permanent hardness, and of nitrates, are high. The two former probably are due to the presence of magnesian salts in considerable quantity; but there is nothing in the analysis to account for the epizoöty of Paralysis. Neither copper, arsenic, nor lead are present.

MUNIPURI HORSE DISEASE.

BY M. HORACE HAYES, CAPTAIN BENGAL STAFF CORPS.

(*Author of "Veterinary Notes for Horse Owners," etc.*)

IN Munipur and Cachar (Eastern Bengal), a most deadly epizoöty —commonly called Munipuri Disease—has been known to break out from time to time among the ponies of these districts.

I use the expression "ponies," because the indigenous *equidæ* rarely exceed thirteen hands in height, while the imported ones seldom range more than another three or four inches.

This disease has, I believe, never up to the present time been described in any scientific work—which may be accounted for by the fact that qualified men have had but few opportunities of observing it.

My regiment being stationed in Cachar, and as I am known in India as an author on subjects connected with horses, my aid, in the entire absence of any veterinary surgeon, is frequently sought in cases of sickness among the ponies of the place.

The disease in question is commonly known by the following symptoms: Sudden and great depression of spirits, and debility; there is, usually, swelling of the tissues beneath the larynx; the breathing, which is at first accelerated, becomes gradually more and more painful, till the animal finally dies, and apparently of suffocation; there is no cough.

The disease generally runs its course in about forty-eight hours.

CASE I.

The first case I was called to see was a grey gelding, 13·2 hands high, twelve years old, that had just recovered from a vertical fracture of the *os suffraginis* of the near fore-leg, and for the previous three months had been kept principally on grass, with a little bran. He was, immediately before the attack, in good health, and had commenced walking exercise.

On the morning of the first day (early last April) he was observed to be dull and off his feed. I saw him about five o'clock on that afternoon. He was then very much depressed; his skin and mouth were hot and dry; pulse 82 per minute, weak and oppressed; breathing somewhat hurried, and chiefly abdominal; conjunctival and Schneiderian membrane congested, and of a dark yellowish-red appearance.

I gave a drench of oil of turpentine, 1 oz., linseed oil, 10 oz.; and desired that he should have ½ oz. of nitrate of potash in his water, of which there was to be an unlimited supply; and further directed that he was to get, during the next day, three drenches of 1 oz. of sweet spirits of nitre in a pint of cold water.

I did not see him again till five o'clock on the evening of the next day. He was then lying down, with his neck straight and nose poked out, and was breathing with extreme difficulty, respiration being entirely abdominal. I performed tracheotomy, but this operation did not relieve the symptoms in the slightest. In about a quarter of an hour the animal became convulsed, and died in great agony shortly afterwards, the limbs alone moving, while the head and neck were kept fixed in an extended position. There was no cough at any time, and the pony lay down as usual, and got up again on to his feet in a natural manner during

the attack. There were no colicky pains, although the animal appeared to be in distress all the time. There was no coma.

Ten minutes after death, I found the mucous membrane of the larynx to be much congested and rough, as if covered with small immature pustules. The tissues between the larynx and the skin were infiltrated by a yellow watery fluid, which caused some external swelling, though not to any great extent. The venous blood presented a tar-like appearance, while that in the carotid arteries was dark-coloured and thick.

I could detect no petechial spots on the visible mucous membranes, nor swellings about the body indicative of "Charbon."

I examined the trachea as far as its entrance into the chest; and its mucous membrane throughout, as far as I could see, was intensely congested.

There were no false membranes indicative of Diphtheria.

CASE II.

A chesnut pony, 13·3 hands high, aged. Was in rather poor condition, and had been previously out of sorts for a few days, though doing his usual work. I saw him about six o'clock p.m. on the 14th of April last. He presented exactly the same symptoms as the case I have just described. I gave a drench of 1 oz. of sweet spirits of nitre in a pint of cold water, and directed that he should be carefully nursed, and should have plenty of water to drink, and any green or soft food he might care to eat. I saw him again next morning. The symptoms of the previous evening were aggravated. He was lying down, the respiration was accelerated and abdominal, and the flanks were heaving painfully, while the external opening of the nostrils was somewhat contracted, which gave them a "pinched-in" sort of an appearance. There was no cough. The action of the bowels and kidneys was natural. The pulse was extremely weak and oppressed, and the mouth exceedingly hot and dry.

As I did not know what treatment to suggest, I did nothing further than to ask the owner of the pony (Mr. Hare, Bengal Civil Service) to send for me the moment the breathing became more painful. But, owing to a mistake made by his messenger, I did not arrive till about six o'clock on the same evening. The animal was now lying on his right side, quite motionless, except

that his flanks still continued to heave, while the breathing was very hurried, but seemed to be performed without pain. The nose was protruded, and the visible mucous membranes were quite livid. The owner informed me that about half an hour previous to my coming the animal became convulsed, and struggled on the ground as if he were dying from suffocation, while his body became bathed in perspiration; but that about ten minutes before I arrived the pain appeared to leave him. While we were speaking, the pony stretched out his legs, straightened his neck still more, and died quietly.

Post-mortem appearances twelve hours after death.—*Rigor mortis* extreme; the air-passages were filled with thick sanious froth, which had issued in some quantity from his nostrils. The venous blood looked like so much liquid tar, while the arterial blood was scarcely more fluid or less dark-coloured. There was no watery infiltration into the tissues under the larynx. The mucous membrane of the nasal passages, larynx, trachea, and bronchial tubes was greatly congested, the inflammation appearing to be greater as it approached the lungs; there was extravasation of black-coloured blood (as seen in "Charbon") into the muscular and areolar tissues underneath the trachea, immediately above its entrance into the chest, for about ten cubic inches. Both lungs were acutely congested; the anterior portions of both for about five or six inches—measured horizontally—were quite black. The liver and spleen were much congested; the tissue of the former, on being cut, looking like lung tissue which had suffered from acute Pneumonia. The heart, pericardium, stomach, and intestines were in a normal condition. The left side of the heart was empty, while there was a small quantity of very dark, non-coagulated blood in the right side.

The twelve hours that had elapsed between this examination and death were those of the night, during which the air was moderately cool. There was no heat that would have occasioned any considerable organic change, as ordinary butcher's meat would have kept fresh for forty-eight hours.

Dr. Warburton, Indian Medical Department, and civil surgeon at Cachar, as well as the native doctor of the jail there, assisted me in making this autopsia.

When both of these cases occurred, the weather was moist and sultry, the temperature of the air varying from about 92° F. in the shade at noon, to 75° F. at night, while the ground was saturated with moisture.

During case No. 1, a second pony belonging to the same owner was also affected a day or two after the other, and in the same manner; but I did not see him, as he was sent out of the station with the object of his escaping contagion. He died on the day after he was attacked.

Last January I was called in to see a pony which presented symptoms similar to those first observed in the two cases already described: viz., pulse quick and oppressed; skin and mouth hot and dry; great depression; loss of appetite; visible mucous membranes injected. There was slight swelling under the larynx. Thinking that it was a charbonous disease, I gave 2 oz. of oil of turpentine, guarded by linseed oil, as a drench. He was better next day, and made a good recovery.

I have forwarded to you portions of the larynx and trachea—that at its bifurcation—preserved in spirits of wine.

Since I have been at Cachar, I have seen four or five cases of simple fever of an adynamic type, accompanied by great depression, debility, and loss of condition and appetite, but without cough or any catarrhal symptoms; they all made good recoveries, —the treatment being careful nursing, with the exhibition of turpentine and linseed oil in one case, and sweet spirits of nitre in the others. I mention this because, although I have had a considerable experience among horses in India, I have never observed an instance before of simple fever of this low type. I have seen numerous cases of simple fever of a sthenic character, very similar to an ordinary attack of intermittent fever in man, but without a cold stage. Exposure to the sun, and want of proper ventilation in the stable, were the usual causes. The instances of low fever to which I have alluded occurred almost simultaneously during the cold weather, thus appearing to have been induced by some malarious influence.

[From the symptoms, course, and pathological anatomy of the disease described by Captain Hayes, as well as from the informa-

tion that hundreds of ponies died last year, we incline strongly to the opinion that it is Anthrax—probably in a form alluded to in "Veterinary Sanitary Science and Police" (vol. ii., p. 118). A microscopical examination of the blood or other fluids, and a few inoculation experiments on mice, rabbits, or guineapigs, would decide as to whether it is that malady.

With regard to medical treatment, the internal or subcutaneous administration of carbolic or salicylic acid, with long-continued affusion of cold water to the region of the larynx or any other part where localisation is taking place, or even the subcutaneous injection of either of the above acids (properly diluted) into the part, might prove useful. The prophylactic measures we would recommend are those prescribed for outbreaks of Anthrax.—ED. *V. J.*]

SEBACEOUS TUMOURS IN ANIMALS.

BY GEORGE FLEMING, F.R.C.V.S., 2ND LIFE GUARDS.

THE occurrence of sebaceous tumours in animals would seem to be extremely rare, as I cannot find any mention of them in veterinary literature. The following instance, which came under my own observation, may therefore prove interesting.

A brother officer a short time ago casually mentioned to me that he had a very small aged pony at his seat in Sussex, which the local veterinary surgeon had told him was suffering from Cancer of the prepuce, and as the disease was incurable, that the animal should be destroyed. As the pony was an old favourite and Cancer supposed to be unusual, he expressed a wish that I should see it, and report if operative interference would be likely to yield any benefit. Having assented to his request, the pony was brought up to Regent's Park Barracks, and examined. At the anterior part of the prepuce was a large, red, fungus-looking, and somewhat globular mass, about the size of a small cauliflower, the under portion of which was dark-coloured, as if gangrenous. The mass emitted a most offensive odour, and the under part of the belly and inside of the thighs were soiled with the discharge from it. A very superficial examination, in the standing posi-

tion, satisfied me that the tumour—which was extremely friable and vascular—grew from the penis, and that the prepuce was not at all involved. From the very diminutive size of the pony, and its restlessness during manipulation, a more exact examination could not be made in this position; it was therefore decided to throw it down, and after ascertaining the connections and relations of the tumour, to remove it if possible. When the animal was placed in the dorsal position, it was found that the growth was situated in the vicinity of the *glans penis*, and that the anterior portion of the organ was external to the prepuce, the great size of the tumour preventing its retraction. An attentive scrutiny led to the discovery that the substance of the penis was not implicated, the tumour extending no deeper than the integument. This it was soon dissected from, and the hæmorrhage from several small arteries was checked by torsion and the actual cautery. The urethra was not involved in the growth, and three or four small warty-looking masses, situated behind the large tumour, were excised. When the pony was allowed to rise, there was a good deal of bleeding from the now retracted penis. This was stopped by plugging, for a short time, the interior of the prepuce by fine tow saturated with cold water. For a few days subsequently, a small quantity of pus flowed from the prepuce; but there was no tumefaction, and the pony micturated without difficulty. In a fortnight it was sent home apparently cured, and I am informed that it has continued well.

The chief portion of the tumour weighed one pound seven ounces; but as, owing to its soft friable nature, the total mass broke up to some extent, the entire tumour must have amounted to considerably more weight. In appearance (except for its colour), and in section, it greatly resembled a well-grown cauliflower; though of course it was very soft, and could scarcely be cut without breaking down.

My friend Dr. Thin examined it microscopically, and kindly furnished me with the following report as to its histological composition:—

"This tumour is constituted almost entirely by epithelial cells, of the size and form of the cells of the *rete mucosum* of the epidermis. The cells are all of them so-called 'prickle' cells,

but they adhere very loosely to one another. In consequence of this loose adhesion, portions of the tumour, both in the fresh state and after hardening in solution of bichromate of potash, can be readily disintegrated into very minute fractions by needles.

"When examined fresh, the cells were filled with an oily sebaceous fluid. Being of a soft consistence, in the specimens examined a number of cells were always torn, and the oily substance could be seen escaping from them. When a portion of the tumour was broken up in a small drop of fluid, and a cover-glass put over it, an oily circle was seen by the naked eye to form between the glasses, and it was evident that the proportion of fatty or sebaceous matter in the mass was very large. Yet, although the contents of the cells showed them to be of the nature of the cells of sebaceous glands, the microscopic appearances were, as has been already remarked, those of the *rete mucosum*.

"The cells were grouped in large ovoid or somewhat spherical masses. The circumference of these masses was formed by a fine basement membrane, and the outermost layer of cells had a cylindrical form, and rested on this membrane in a manner perfectly analogous to that which is characteristic of the deepest row of cells of the *rete mucosum*.

"Between these cellular groups there were narrow tracts of imperfectly fibrillar connective tissue, rich in cellular elements. The latter were small endothelial cells, mostly pentagonal and hexagonal in form, with a large nucleus nearly filling the cell. In some of the best preserved specimens examined, patches of these cells—three and four inches long and wide—were isolated. It is, therefore, highly probable that the cells of the interlobular connective tissue constituted an endothelial membrane.

"The tumour is accordingly to be considered as a sebaceous growth, of which the cells have been formed so rapidly that the external characteristics of the epidermic cell have not been lost."

THE DESTRUCTION OF INCURABLY-INJURED AND DISEASED HORSES.

BY JAMES LAMBERT, F.R.C.V.S., 17TH LANCERS.

THE subject of the destruction of horses suffering from incurable injuries and diseases is so important, that I ask space for this paper, in which I propose to treat the matter from a *practical* and *prudential* standpoint. To prevent misunderstanding, I will begin by saying that occasions may arise (but they will be very rare) where the veterinary surgeon, if there be no one else available, and if he has proper means, may himself judiciously perform the act of destruction. He therefore should know how to do it and supervise it when necessary.

A correspondent of the *Army and Navy Gazette* of June 22nd, writing in the case of Lord Napier's charger, expressed the opinion that few men, no matter who they be, have the requisite nerve and calmness to destroy a horse without great risk of a blunder; that the act of destruction should not, if avoidable, be performed by the veterinary surgeon himself; and that it should not be done without proper means, as undue haste only ends in making matters worse. All experienced veterinary surgeons will allow that, as quoted above, few men have the nerve and calmness to destroy a horse properly. The reason is not far to seek; but in order to treat the subject fully, it is advisable first to consider the destruction of life as lawfully applied to man,—not however to institute odious comparisons between the executioner who is the instrument of punishment, and the destroyer of the horse in his merciful task, but to show how rare are individuals who can take away the life of the higher animals without the occurrence of deplorable mishaps.

When it was the custom to dispose of criminals by decapitation, it was difficult to obtain a skilful executioner; and it is the same in the present day. It would be thought an easy feat for a practised individual, with a callous heart and a properly made and well-sharpened axe, to lop off a head without a mistake; but our English history teems with ghastly examples, that in executions involving the shedding of blood, human nerves are

often found wanting when most needed. It is unnecessary to give many instances, but the execution of the Duke of Monmouth, as related by Macaulay, may be mentioned; and examples could be brought forward *ad nauseam*. Some will, however, observe that to despatch a delinquent by the axe was only difficult when the operator happened to be suddenly and unexpectedly nervous or emotional; but in these days, even by what appears the simple but still barbarous and disgusting method of hanging, we not seldom see in the newspapers accounts of frightful failures.

Having, then, come to the destruction of the horse, so far as the veterinary surgeon is concerned, I will give reasons why he should not, unless in cases of absolute necessity, do it himself. Some men for a certain part of their lives are possessed of great firmness, and can perform a difficult operation with tolerable certainty of success. Some can fire a pistol or other arm without jerking it up or shutting their eyes; but very many cannot, after much practice, let off a firearm without committing these common faults, even when only aiming at a lifeless object. This arises not from fear, but depends on the mental and physical organization of the individual; for the object aimed at being inanimate, there should be little cause for nervousness. Well, if such faults are common when the mark happens to be only some such thing as a piece of paper, how much more are they likely to occur when the target is the "noble beast," the horse, who may move his head at the very moment of firing, and when the slightest wrong direction of the aim may cause a horrible spectacle!

In discussing the subject at various times extending over many years, I have been on several occasions invited by those who thought they could do it well to witness their accomplishment. In almost every case, no matter what method was employed, the result has been a failure. I could give many instances of failures by those who had never failed before, but similar cases are known to every veterinary surgeon of experience. Such mishaps always occur at the wrong time, and usually when they can make the worst impression. They arise from circumstances over which the operator has no control, however skilful he may be; for a living sentient body often comports

itself very far from expectation, and it is too frequently forgotten that it is not like a clock or other instrument made with hands.

Such methods as slitting the carotid, pithing, blowing, and others, are often not accomplished until after two or three attempts, and all veterinary surgeons of experience can tell of disasters, so far as these operations are concerned; but this is only to be looked for, as they are generally more difficult than shooting. When successful, they are almost always disgusting to the bystanders; they look cruel and clumsy; they require, when the case has occurred unexpectedly, means of restraint which are generally absent; and when best accomplished, instead of winning good opinions for the operator, they leave a lurking feeling of dislike in the breasts of those who have witnessed his handiwork. Even the man who shoots a horse gets little praise for his skill, and the remarks of the bystanders after a successful shot prove that, so far as he himself is concerned, he has not made a very favourable impression.

In reply to the above it may be said, "It is all very well, but when a horse is to be destroyed some one must do it." Of course, and some one must groom the healthy horse and sweep the stable; but for the reasons above given, the act of killing should not be performed by the veterinary surgeon, unless there is no one else who can do it. I mean, that he should be the last to undertake it, and especially if it be before spectators; for the consequences to him are very serious, while a mistake on the part of others does not attract much attention. It is almost needless to repeat that in any case no undue haste should be used, and that the attempt should not be permitted until the arrival of proper means.

From all the preceding observations, may we not draw the inference that many skilful and practical veterinary surgeons cannot well destroy a horse? But it is not an inference—it is a fact; and one which, when we well consider the matter, is only to be expected. Many good and famous surgeons cannot perform, without much risk of failure, certain operations which to others are comparatively simple; hence we have so many specialists in human medicine and surgery—the subject being too

far-ranging for one mind to grasp everything. The same rule applies to our science. Many veterinary surgeons cannot perform certain operations, such as neurotomy, etc., so well as others. Some are good at one thing, indifferent at another, and *vice versâ;* and this observation applies to those engaged in every art and science, and also to many pastimes. How little, then, can we expect all veterinary surgeons to be able to use successfully, on every occasion, firearms or the knife of destruction before spectators, or even when no bystanders are present! We can so little expect it that we rather look on with anxiety, fearing a failure.

When we cannot cure our patient, if we immediately proceed ourselves to kill him we are sure to make a bad impression. Experienced and wary practitioners, deeply and wisely conscious of the maxim that their mission is to cure and not to kill, leave it to others to do, and especially if it be before the owner of the horse, or in presence of spectators, or in situations where the operation, no matter how well performed, will only excite disgust. In doing so they are wise, because they well know that by a too probable failure the good reputation of a lifetime may be tarnished; and that if the newspapers get hold of the story, they may delight in casting unmerited slanders on our profession.

A dreadful operation, if undertaken from curative motives, does not inspire repugnance to the operator in the minds of the lookers-on; but the instinct of self-preservation is so great, that the killing of one of the higher animals—of one of the friends of man—even at the dictates of mercy, will, so long as human nature is constituted as it is, leave a disagreeable impression on those who have witnessed it.

As a rule, the best and most humane way of destroying a horse is by shooting behind the ear or just above the star on the forehead; but to do it well requires cool and strong-minded men, who have not lost the nerve of youth. Some men are usually to be found near a veterinary surgeon's establishment who are also expert at poleaxing, which is the next best method after shooting; and practitioners usually employ them or send for the knacker. In street accidents and some other situations,

shooting would be dangerous. For such cases the surest and most suitable way is pithing (if it be feasible), or poleaxing; and if a knacker is too far off or not available, there is generally a butcher's shop near from which an expert man may be got to despatch the horse in this manner for a small sum. Of course, in a street it is desirable to avoid any method requiring cutting or the shedding of blood.

Since the case of Lord Napier's horse I have had conversations on the subject with many civilian veterinary surgeons, including four of the largest and most successful practitioners in the kingdom. They all have stories of ghastly and unexpected failures; and their experience only too well bears out the opinion, to the wisdom of which they testify, that the prudent veterinary surgeon will not, if he can avoid it, himself destroy the horse.

THE FELLOWSHIP DEGREE OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

IN a recent number of the *Field* newspaper the following encouraging allusion to the Fellowship Degree appeared :—

"Under the provisions of the Supplemental Charter which was granted to the Royal College of Veterinary Surgeons recently, the corporate body have power to create Fellows and honorary Fellows. The first degree is to be conferred only on members of the veterinary profession; the second may include, we understand, distinguished professors of any science. As soon as the sign manual was obtained to the Charter, a number of Primary Fellowships were conferred, without examination, upon members of the Royal College of Veterinary Surgeons who had in any way distinguished themselves in authorship or research. Some of the members first nominated declined the proffered honour, but the majority accepted it; and the number of Fellows has since been increased by the addition of several members who have submitted themselves to the fellowship examination which has been instituted by the College. Of the ultimate good effects of the institution of of the higher degrees no doubt can be entertained; many men, who would otherwise leave their college and its science behind them when they enter into practice, will remember that there is a further test awaiting them in the future, and they will be stimulated to continue the pursuit of those studies in advanced science, on the attainment of a proficiency in which the advancement of their art in a considerable degree depends.

"The public will not be without a share of the advantages which are to be expected to arise from the institution of Veterinary Fellowships, as they will come, in time, to recognize that Fellows of the College are necessarily men who have gained practical experience in, as well as scientific knowledge of, their profession."

Editorial.

THE UTILITY OF HORSE-SHOEING.

FEW subjects relating to horse management have received so much attention as horse-shoeing, and it is one on which the specialist and amateur have almost equally expended much thought, speculation, invention, and experimentalising. The necessity for protecting the hoofs of working horses—in Western countries at least—by some simple, economical and non-hurtful device, has made itself felt from the very earliest times; and we have sufficient evidence to show that the Gauls, probably some of the Germanic tribes, and the Romans in Britain, if not the ancient Britons, resorted to the iron shoe now in use, securing it to the hoof by means of nails as is done now-a-days. We may be certain that nothing but the direst necessity could have led to the adoption of such a bold, yet simple and ready mode of economising the powers of a horse, and rendering him a hundredfold more efficient. From climatic and other influences, it must have been early discovered that in long journeys over rugged ground, and carrying weight, the hoofs of the hardy steeds of primitive times would quickly become worn, and the animals be rendered unserviceable through being footsore. It is probable that many devices were introduced to guard against this cause of inefficiency, before the crescent-shaped iron rim was nailed to the lower surface of the foot; but it has survived them all, and, strange to say, notwithstanding the ingenuity of generations of inventors, improvers, and modifiers, it remains to this day the only reasonable and satisfactory kind of hoof-protection known to us. True it is that, in some parts of the world, horses can perform a certain amount of work without shoes; but as true is it that they cannot do so in other regions. The Mongols do not shoe their marvellously enduring ponies, yet these in long travels wear their hoofs through to the quick, and the creatures are lame. The Tartar remedies this accident, as he best can afford to do, by riding another steed of his drove, or exchanging the cripple for a sound one at the nearest encampment. In India, cavalry do good service though the horses are only shod on the fore-feet, and at the Cape of Good Hope it is the same; in some parts they can even perform fair work without shoes. Australia is another region in which horses can journey without shoes, so long as they do not travel on artificial roads; and in some other parts of the world horse-shoes are not absolutely necessary. In Japan they were unknown until 1860, when our own farriers introduced them to the notice of the Japanese: previous to that time the only hoof garniture in use was a rice-straw sandal,—for although the ponies of that remarkable country have excellent hoofs, yet in carrying loads for any considerable distance these are quickly worn down.

The evils of modern horse-shoeing—we allude to the shoeing on "improved principles"—have long been recognised; the terrible effects of denuding the foot of its natural covering by means of knife and

rasp, attaching heavy and unsuitable shoes, making the foot to fit the shoe, and other barbarities of comparatively recent times, have been only too apparent to attentive observers, as they have certainly led more or less rapidly to the deterioration of horses so maltreated, and have inflicted great suffering upon them. This abuse of a most useful art has given rise to much complaining and justifiable fault-finding, and those who have not rightly appreciated the demerits of the so-called "improved principles" have stigmatized the nailed shoe as the curse of horse-flesh. Consequently, attempts have been made from time to time by enthusiastic and humane—but only too often unpractical and imperfectly informed—people to substitute something else for this fixed armature. It is needless to repeat that all their attempts have failed, for reasons which might have been indicated beforehand by those who understood the horse's foot—anatomically and physiologically—and its requirements; and there are grounds for apprehending that success in this direction is not very probable in the future. This failure has led to the belief in some minds, that because horses can work without shoes in certain countries of the world, they should do so in our own. Nothing could be more fallacious, as repeated experiments have demonstrated often and over again. Our variable moist climate, hard artificial roads, the severe exertion we demand from our horses, their very unnatural treatment in the matter of food and stabling—all conspire to render shoeing absolutely essential to the profitable utilization of this most excellent servant. It is in the experience of all those who have had much to do with horses, that young animals which have never been in the hands of the farrier, are soon footsore when taken from their pastures and travelled on hard or newly-metalled roads, and especially in wet weather—even when carrying no weight. Nothing could be more absurd than to suppose that our mammoth dray-horses, the slaves that toil in cabs and omnibuses—stopping and starting every few minutes—could ever be brought to work even for a day without shoes. Had this been possible, it would long ago have been practised; but it is not possible. Without shoes a horse would damage his hoofs as much in a week as would require three weeks' rest on soft material to repair. We surely need not point to the fact that the growth of hoof-horn is slow, and that it is a material which does not offer great resistance to wear on hard roads in wet weather. Certainly its powers of resistance can scarcely be compared with those of iron; and some idea may be formed of the effects of every-day labour on the feet of horses, if we take into consideration the degree to which iron shoes are worn on our paved roads. To ask us to believe that hoofs alone can withstand this amount of wear, is to presume too much on our credulity and to ignore our experience. Many people mistake the abuse of farriery for its use. Horse-shoeing, intelligently practised, confers great advantages upon the horse, and benefits his owner. The good service it renders far more than counterbalances the evils it produces,—indeed, we are really unable to discover what evils attend or result from shoeing as it should be done. Nothing is more beneficial to the horse, or more easily practised

by the farrier, than shoeing on sound physiological principles; nothing could be more injurious to him, or tend more to abbreviate his usefulness, than the "improved principle" method so much in vogue.

It is absolutely necessary that horses in this country be shod,—but this shoeing need neither be injurious nor ineffective. Nothing better has been devised than the nailed shoe, and we are of opinion that it will be most difficult to displace it.

It is the faulty treatment of the hoof when in the farrier's hands, and the erroneous notions which prevail as to the application of the shoe, which bring undeserved discredit upon shoeing. Because ordinary shoeing is productive of harm, that it is no reason why we should seek to discard shoes. In fact, we cannot do so; and those who attempt it will assuredly bring themselves within the notice of the Society for the Prevention of Cruelty to Animals. If they persist in working footsore horses merely to indulge a silly crotchet, they place themselves pretty nearly on a level with those who so frequently figure in the police courts as guilty of cruelty.

NEW DRUGS, APPLIANCES, ETC.

Unguentum Petrolei.

Unguentum Petrolei is an opalescent and heavy paraffinous substance, or, as it is designated, an oleaginous hydro-carbon, introduced by Houghton of Philadelphia, and likely to prove a most useful article in the veterinary surgeon's pharmacy. We have given it a somewhat extensive trial, and are in a position to recommend it as a most effective demulcent and protective agent in the case of blistered and inflamed surfaces, as well as in that of sloughing wounds and ulcerated or abraded tissues. It owes its value to the paraffin it contains; and this renders it, in addition to the properties just mentioned, an excellent antiseptic and antizymotic remedy. Its usefulness should be also marked in destroying external parasites, and in preventing the attack of "fly" in sheep. It well deserves an extensive trial in obstetric practice, as a lubricant, emollient, and antiseptic.

The Unguentum, from its antiputrescent properties, should likewise be a useful medium for the preservation of, as well as a vehicle for, certain drugs, from its never becoming decomposed or rancid.

It is sold in tins containing from one to ten pounds, and its cheapness is not the least of its recommendations.

Spratt's Horse Biscuits.

The advantages to be derived from having horse's food in a very portable form are obvious, and they have more particularly presented themselves in war, when the bulky character of ordinary horse-provender proves such an obstacle to the rapid movement of armies in countries

where forage is scarce. Consequently, we have had, in recent years, various attempts at reducing the bulk of such food to a minimum, while retaining the maximum of its nutritive properties. During the Crimean War, food composed of chopped hay and straw, mixed with crushed oats and other alimentary substances, to which certain condiments were added—the whole being compressed into a solid mass, for facility of transport—was introduced.

Quite recently, the Russians in their war with Turkey resorted to a manufactured forage, as alluded to at page 141 of the *Journal* for February; and there is every probability that, in future campaigns, there will be greater demands for such handy provender. Not only this, but we are of opinion that it would often prove most useful under certain circumstances other than those of warfare—as in hunting, travelling, etc.

The desired portability has been obtained in various ways, but perhaps the best form is that of the biscuit; and among the manufacturers of Horse-biscuits, Spratt takes a prominent place. His biscuit is square, measures about four inches, and weighs less than two ounces. The principal ingredients of which it is composed are, we are informed, good sound oats weighing 40 lbs. to the bushel and ground up with the husks on, ground maize and beans, pollard and fine middlings, and also a very considerable proportion of dates, with a small quantity of iron. The biscuit is well baked, and so compact that it is not easily broken; neither is exposure to the weather likely to affect it injuriously—at least for some time. We have fed a number of horses with it for a long period, and find that all take to it at once and appear to be fond of it; and, so far as our trial goes, it answers well as a substitute for at least a portion of the ordinary ration of forage. On emergencies, there can scarcely be any doubt that horses could do effective service for a few days on Spratt's biscuit alone. Under other circumstances, however, if a horse has been fed as usual in the morning, twelve or fourteen biscuits should suffice to carry him through a severe day's work until his return home in the evening. Two or three biscuits given in the course of a long journey, or during a check in the hunting field, would often go far to sustain an animal's vigour, and prevent that state of exhaustion which renders labour painful, or destroys the appetite when toil is completed. During a campaign they would be found eminently serviceable for cavalry horses while scouting, on picket or hurried marches, and in many other emergencies. Their great portability and easy storage are certainly advantages not to be lightly ignored. The addition of a little coarse sugar to the biscuit might improve it.

NEW MEMBERS OF THE PROFESSION.

At a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons held July 2nd, the following students from the Royal Veterinary College were admitted members of the profession:—

Mr.	John Burke Savage,	Newry, Co. Down, Ireland.
„	William Markham,	Rugeley, Staffordshire.
„	John Rose,	Much Wenlock, Shropshire.
„	George Fowler,	Greenwich, Kent.
„	John Square Brunskill,	Buckland, Devon.
„	Charles Henry Betser,	Steyning, Sussex.

The following students of the same College passed their "Second Examination" on July 3rd:—

Mr.	James Ingham.	Mr.	John Soulsby.
„	Ernest Edwin Batt.	„	William Roach.
„	Herbert Hall.	„	Wm. Hastings Farrow.

Mr. Thomas John Keech.

The following students, also of the same College, passed their "First Examination" on July 4th, 5th, 6th, 8th, and 9th:—

Mr.	Harry Chrichley Talbott.	Mr.	John Owen.
„	Herbert Alfred Toulson.	„	Frederick Wm. Whitney.
„	Walter Francis Day.	„	Wm. Frederick Garside.
„	John Bush Hart.	„	John Darby.
„	Stephen Marsh Smith.	„	Henry Thos. Wm. S. Mann.
„	Thomas William Cave.	„	George Deveson.
„	Frederick Leeds Gooch.	„	Theodore Chas. Toop.
„	Johnson Wm. Carlisle.	„	Sidney Villar.
„	William Francis Mulcahy	„	Frederick Francis Woolcott.
„	Arthur Wm. Briggs.	„	Alfred Harris.
„	George Richard Griffith.	„	William Caudwell.
„	Donald Gregory.	„	Edward Harry Wand.
„	Thos. Jarvis Rippon.	„	Charles Taylor.
„	George Henry West.	„	Thos. Wm. Lepper.
„	Thomas Skilton.	„	Enoch Green.
„	Arthur Samuel Auger.	„	Robert Joseph Dawson.
„	Harry Martin Rule.	„	John Kirby Pilkington.
„	Ernest Robert Harding.	„	Henry Keyes.
„	George Rees.	„	Edwd. Percival Smith.

THE HORSE-SICKNESS OF SOUTH AFRICA.

We are indebted to Mr. Collins, Principal Veterinary Surgeon to the Army, for a copy of the Proceedings of a Board of Officers ordered to assemble at Pretoria, Transvaal, South Africa, by General Thesiger, to report upon a fatal disease among the horses there. There is nothing novel in the report. The malady is that which has been known in South Africa since it was occupied by Europeans, and is designated by the English the "Horse Sickness," and by the Dutch Boers the "Paard-zeikte." From the earliest times it has ravaged the horse-droves of the colonists, and is alluded to by nearly every traveller in that part of Africa. It is more especially mentioned by Livingstone, Anderssen, Burchell, Scherzer, and others, and we have on several occasions noticed it in the public press and elsewhere, and particularly during the mortality among the mules and horses of the Abyssinian Expedition in in 1868. (See *The Standard* for January 24th, 1868.)

Scherzer, in his narrative of the voyage of the Austrian frigate *Novara*, published a few years ago, gives us a good description of it. He writes:

"During our residence in the Cape Colony (in 1857) severe depression existed among the agricultural inhabitants of the western and eastern districts, in consequence of an epidemic (epizoöty?) which, within two years, had carried off 64,850 horses (draught horses, mares, and foals), of the value of £525,000 sterling. Many landowners, in consequence, entirely gave up rearing horses, and turned their attention exclusively to the breeding of sheep. The visitations of this malady are by no means of late introduction, but hitherto they had made their appearance at such long intervals that but little attention was paid to them, and people regarded their return without much alarm. This disease of the horse, usually endemic (enzoötic?) in Cape Colony, assumed every twenty years, owing to some inexplicable causes, an epidemic character, and on these occasions extended over an extensive area, as happened with extraordinary regularity in the years 1780, 1801, 1819, 1839, and 1854. Hitherto no further precaution was taken than, so soon as the disease appeared, to drive the horses from the grass pastures to their stables or covered sheds, and there supply them with fodder—the night dew being considered a main cause of the complaint.

"A resident in Stellenbosch, indeed, maintained that the dew which was deposited during the continuance of the disease tasted quite bitter, and was of an unusual brownish tinge. Singular to say, not the slightest symptoms of illness manifested themselves in the swine, dogs, and birds of prey which devoured the carcases of horses that died of the disease; while the consumption, whether boiled or roasted, of mutton which was ever so slightly tainted with the mere germ of this malady, never failed to produce the most mischievous consequences on the human species. Considering the importance of the subject to a land-holding colony, it could hardly fail that numerous individuals should devote themselves to elucidating the causes of the devastating epidemic; but it must ever remain a striking and significant fact, illustrative of the high standard of cultivation in Cape Colony, that within a very few years 112 different authors published treatises respecting this complaint among the horses. The result of these numerous researches was, that the malady is epidemic but not contagious; that horses driven into the stable before sunset, and not permitted to go out to pasture, are, as a rule, exempted from attack; that those horses which are kept at night in open pounds, or in places where there are heaps of dung, take the disease in a milder form than if suffered to roam at large day and night; lastly, that horses for which no covered shelter can be provided may, with great advantage, be sent to hilly localities and dry runs of land. The practical remedy which was most resorted to consisted in immediate and prolonged bleeding, pushed to actual exhaustion of the animal, in the first stage of the disease."

From the various accounts we have perused of this destructive disorder, we learn that it only attacks solipeds—horses, asses, and mules; and during severe epizoöties, even zebras and quaggas have been found dead in their native haunts, with the characteristic foam filling their nostrils. Ruminant animals are exempted from its ravages; so that while horses and mules are dying on every side, cows, oxen, and sheep are unaffected, notwithstanding Scherzer's assertion that the last-named animals are involved.

A somewhat remarkable feature in the disease appears to be the tenacity with which it clings to low-lying districts, never attacking horses or mules above a certain altitude. Burchell, who travelled in South Africa in 1811, mentions this fact. For instance, when at the Roggeveld Mountains, near the then borders of the Cape Colony, he writes: "The Hantamberg, lying in the direction of N.N.W. from the Roggeveld Mountains, is said to be very high land, and is remarkable for being one of the few situations in this part of the country where horses are not liable to the Horse-sickness which rages during the summer season, and annually carries off great numbers." When

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speaking of the seasons at Klaarwater, he further remarks: "After the middle of October, no frost is expected for seven months; but in the mornings of May it is always found to return, and is the signal for the return of their horses from the Roggeveld, whither they are sent in January to avoid the Paard-zeikte—a fatal distemper to which they are liable in the hotter months. Those who object to send their horses to so great a distance from the settlement are content to run the risk of keeping them in the Langberg (Long Mountain), an elevated mountainous country lying in a W.N.W. direction. This, however, not being so cold as the Roggeveld, is less safely to be depended on. It does not seem that the distemper acquires its full force until the beginning of February; but after then the lower districts of the whole of the extra-topical part of Southern Africa are, as far as my information enables me to speak, subject to its baneful effects. Experience has shown that the first frost, whenever it happens, fortunately puts a stop to its further ravages." And again, at the same place, in January, 1812, he remarks: "As the season for the Paard-zeikte was expected to begin, generally, about the beginning of February, a party of people set out this day for the Colony, taking with them a great number of horses, with which they were to remain till the 1st of May at a farm in the Roggeveld, belonging to a Boer named Franz Maritz. Many of these people had this year sent more than half their horses into the Colony; the other half, in order to be nearer at hand in case of hostilities with any of the neighbouring tribes, were sent off at the same time for the Langberg, under the care of a stronger party. In a former year, when they preferred running the risk of keeping them at the village in the Asbestos Mountains, out of eighty horses there died of the distemper not fewer than seventy. . . . They (the Langberg Mountains) appeared to be very lofty, and it was said that on the other side there is little descent, the country continuing at the same high level; which fact, as the air there must be colder than in the lower plains about Klaarwater, has induced the Hottentots to keep their horses there during the season of the Paard-zeikte. There is also another elevated tract between Langberg and the Kloof, where horses are also kept, and which is therefore named Paardberg (Horse Mountain)."

And Anderssen, writing in 1856, says: "We had only been a short time at Richterfeldt, when three of our mules and the remaining horse were seized with a mortal disease, and in the course of a few hours they all died. Though the loss of the animals was great to us, their death was a godsend to the poor Damaras, who devoured the carcases bodily, and without the slightest disagreeable result. The distemper in question is usually known by the vague name of Paard-zeikte; and, as the cause is totally unknown, no remedy has yet been found efficient to stop it. Throughout Great Namaqua Land it is particularly fatal. Some people attribute this singular disease to poisonous herbs of which the animals have inadvertently partaken, others to the dew, and others again to the eating the young grass; but all these suppositions are highly improbable, for reasons which it would be unnecessary to enter into here. Fatal as the disease is to horses, yet happily there are places (even in districts where it commits the greatest ravages) that are always exempt from it. And as these localities are well known to the natives, if one's horses be sent to them prior to the commencement of the sickly season —usually the months of November and December—the animals invariably escape the malady. The attack of our animals was an unusual exception to this rule, for they fell victims to the disease fully a month prior to the rainy season. From the Orange River, on the south, and as far north as Europeans have penetrated from the Cape side, this deadly disease is known to prevail, and is one of the greatest drawbacks to successful travelling in South Africa. . . . Within Zwartbooi's territory (Namaqua Land) was a mountain called Tans, where horses might pasture throughout the year without being

exposed to the Paard-zeikte, the cruel distemper to which these animals are subject. Almost all the Northern Namaquas, Jonker among the rest, are in the habit of sending their horses here during the sickly season."

The geographical extent of the malady is only hinted at by Anderssen, and is not alluded to by Scherzer, Burchell, or other writers on South Africa. Baker, however, in his book on the Albert N'yanza, evidently describes this Horse-sickness as attacking his animals during his journey towards the sources of the Nile; and there is some reason to believe that it was the same disorder which wrought such havoc among our horses and mules in Abyssinia. It is most noteworthy, though not at all remarkable, that very little indeed is known as to the etiology or nature of the disease, notwithstanding the great losses it has occasioned, and still causes, in this important division of our great empire. Modern scientific modes of investigation have not been brought to bear in throwing light upon it; and we fear, unless the Colonial Government is led to see the necessity for, and value of, such an inquiry, that our knowledge of the Horse-sickness is likely to remain as limited as it is with several as serious disorders of animals at home or in other of our possessions abroad. In the meantime we shall probably have to be satisfied with the convenient but unsatisfactory opinion that it is due to a "blood-poison," produced by a too luxuriant growth of herbage, or to "something in the air." In some of its features the malady resembles Anthrax, but in others it differs from it. Its identity or non-identity with that world-wide entophytic affection can only be established by scientific observation and experiment. We would gladly do all we can in the latter direction if we could be furnished with material preserved as indicated for Loodiana Disease in the last number of the *Veterinary Journal*.

Meanwhile we may state that the report from Pretoria give us no more information than we have been in possession of for many years; and this is probably owing to the fact that neither the Board nor evidence possessed scientific or medical knowledge. The Colony would appear to be destitute of veterinary surgeons, if the documents forwarded to us are acceptable as proof —notwithstanding the great agricultural wealth of the Cape Colony, and the existence of a harassing war in the Transvaal. Colonel Pearson, commanding the troops in Natal and Transvaal, states that, short of removing the Government horses to a more healthy district (which for political reasons could not be done), nothing was left untried to preserve their health. Colonel Montgomery, writing from Pretoria, Transvaal, mentions that a considerable number of horses belonging to private individuals in the neighbourhood had died, many of them "salted" (seasoned?), and nearly all stabled. The percentage of deaths among the army horses was high: in one lot of sixty-nine, as many as twenty-three had succumbed between February 9th and April 8th. He gives the symptoms as those of "acute Fever, heaving of the flanks, great difficulty of breathing, in most instances running at the nose, nostrils and head much swollen, and in many cases much swelling over the eyes." On *post-mortem* examination, in all cases "lungs and throat were diseased, and tongue quite black. There was, in many cases after death, a great flow of matter from the nostrils." The Board, consisting of three executive officers, did not take the evidence of Mr. Wood, farrier and acting veterinary surgeon, whose treatment of the disease was specific, and not divulged. The Board could not arrive at any conclusion as to the origin of the malady, nor how to prevent it—considering that of twenty-one deaths, thirteen of the horses had been stabled. The disease appears to have been very virulent in the district this season, several inoculated (?) or "salted" horses having died.

One witness, (*A*) of twenty-eight years' experience, to the question as to whether any reason could be given for the prevalence of the Horse-sickness

at that time of the year (April), states that on calm nights, when the dew is heavy on the grass, the horses, if left to feed on it, are sure to get the sickness,—also if their food is left out while the dew is falling, and given while it is on it. On very windy nights, or when the rain is falling, they are safe. Another witness (*B*) says it is caused "by some poison in the dew, as grass well washed and cleansed from dew will not produce the disease; while a third witness (*C*) asserts that the sickness appears after the first rain and disappears after the first frost.

With regard to prevention, Witness *A* does not know of a sure prophylactic. "If horses have to stand out, keep the nosebags on them. Tar or harlemensis smeared in their nostrils is said to be good." He knows of no cure; neither does Witness *B*, who recommends keeping the horses permanently stabled, on dry forage, with rock-salt in the manger, and a condition powder twice a week. Witness *C* says that "stabled horses never get the sickness, and adds that garlic is a preventive, but it unfits a horse for heavy work. He adds that aconite and belladonna have been given as a remedy with some success. According to the three witnesses, the malady is neither infectious nor contagious. With regard to location, *A* says the sickness is bad on the north side of the watershed, not nearly so bad on the south side—in fact, very little known. *B* states that, with the exception of the High Velt, "the disease is general, and the more virulent as you go north—valleys and the banks of rivers where the dew-fall is heaviest, are fatal; and *C* adds that it is general over the district.

With regard to stabling, *A* remarks that "horses kept in stables and carefully fed and looked after will not get the sickness. Picketed without nosebags or other precautions, they are pretty sure to get it. Running loose they are sure to." *B* corroborates this by stating that "horses well stabled and attended to are not at all liable to the disease, while if left in the open, picketed or loose, it is fatal in the majority of cases; and *C* gives similar evidence.

With respect to premonitory symptoms, *A* says horses are "sometimes dull and sluggish, but generally very few signs are given, and sometimes they will drop dead without any sign;" *B* states that premonitory symptoms are observed only in rare instances, and as a rule there are none; while *C* declares they are entirely absent. With regard to incubation, *A* and *B* give this period as about eight days, and *C* as eight to twelve days.

This is about the extent of the information we possess regarding a very interesting disease of solipeds, to which we have in previous years devoted some attention. Whether it is Anthrax, malarious in its origin and nature, or due to some toxic principle in the dew, must be left to future investigators to decide. We may note, however, that some African explorers, and particularly Burton, have drawn attention to the evil effects of heavy night dews on the human species in some parts of that great continent.

REPORT ON THE PATHOLOGICAL ANATOMY OF BOVINE CONTAGIOUS PLEURO-PNEUMONIA.

BY GERALD F. YEO, PROFESSOR OF PHYSIOLOGY IN KING'S COLLEGE, LONDON.

(*Continued from page* 42.)

Broncho-vascular Lesion.—The part taken by the bronchial tubes in the chain of pathological processes seems to me so important, that I think it well to describe the changes found in them quite independently of those occurring in the lung tissue.

I find it convenient to associate the description of the vascular lesions with those of the air-passages, because, anatomically, they are very intimately connected, and because the morbid processes in the one help to explain the changes that take place in the other.

The bronchial tubes and bloodvessels have not, as far as I can ascertain, received very much attention. Those authors who describe the change commonly found in them consider it to be secondary to, or sympathetic of, the affections of the lung and pleura. Every examination I have made of diseased lungs appears to me to contradict this view, and in spite of a prejudice in favour of the accepted views, the opinion has been gradually forced upon me that the pathological processes in the bronchi are of the greatest importance, and throw considerable light on the initial stages of the disease.

I have never examined a lung affected with Pleuro-pneumonia in which there was not a well-marked and characteristic lesion of the bronchial tubes of the part most severely affected. No matter how small the focus of disease in the lung may be, or how little advanced a stage these morbid changes may have reached, there is always definite disease in the corresponding bronchus, extending some distance along the tube, but more or less localised to the diseased neighbourhood. In the small foci of consolidation, where the disease may be regarded as just beginning, the morbid process in the bronchus is generally more extended, and shows evidence of longer duration than the change in the lung parenchyma. This applies only to the part of the lung in a state of real consolidation, and not to that part which is translucent and extended over a large subpleural area. In the latter part the bronchial lesion is often wanting.

The cavity of the air-tubes of the opaque solid part is always plugged with a dense adherent mass of tough granular material. This completely occludes all the small bronchi, and extends into the neighbouring larger ones, tapering to a fine point towards the less diseased tubes, where it is commonly surrounded with a quantity of tenacious frothy mucus, which occupies the bronchi for some distance towards the root of the lung. In passing from the larger healthy bronchi to those in the diseased focus, one meets with every stage of transition, from the ordinary frothy sputum of acute Bronchitis to tenacious mucous or fibrinous masses which stick to the wall of the bronchus. Often a long branching cast of the air-tubes may be drawn out from them, here and there some of the branches breaking off and remaining impacted in the tube.

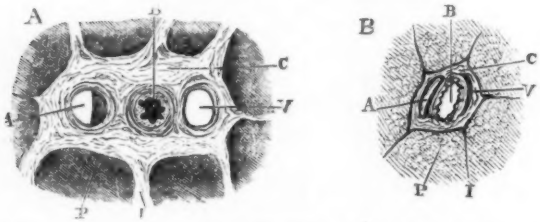
After the removal of the plug, the mucous membrane lining the bronchi is found to be rough and discoloured, and stripped of its epithelial lining. In the neighbouring tubes there is generally intense congestion of the membrane, with patches and streaks of ecchymosis scattered here and there over the surface. The longitudinal folds of the membrane are always greatly exaggerated, showing firm contraction of the wall of the tube. Throughout the opaque part which shows the actual focus of disease the mucous membrane is of a dull grey, or muddy-yellow colour, uneven and rugged on the surface.

Wherever the lining membrane of the bronchi is congested, they are found to have suffered more deeply. Their proper walls are thickened, their coats being separated one from the other by a kind of tough exudation. The walls of those air-tubes which contain the firm plugs are always enormously thick and dense. Even the small tubes, which are normally very thin, transparent, and yielding, become tough, opaque, and rigid canals—the wall often exceeding in diameter the lumen of the tube. Besides the thickening of the walls of the bronchi, their delicate connective sheath is implicated throughout the diseased part. This fine elastic substance becomes the seat of dense exudation, which changes the thin, yielding, cobweb-like sheath into a tough and rigid case

(Fig 2, A). This exudation appears to be very similar in character to that which fills the interlobular spaces, and it presents the same varieties and occupies the same relation to the tissue in both these situations. By means of the exudation, the peribronchial lymph-passages are rendered strikingly obvious, as if they had been filled with some pale opaque injection mass. The course and relations of the larger channels may be thus easily followed with the naked eye. The clear transparent fluid exudation which occurs between the lobules in the more extended part of the lung lesion, is not often met with about the bronchi. I am led to suppose from this that the exudation is more dense from the first in this region, or that it becomes solid at an early date after its commencement.

The delicate fibrous tissue, which forms the bed of the lymphatics around the bronchus, seems to undergo a slow process of thickening; the elements of the tissue rapidly proliferating. In the very advanced stages, where the fibroid change has had time to occur in the lung, the tissue proliferation attains a maximum, and, as already mentioned, may cause the occlusion of tubes of considerable calibre.

FIG. 2.—Transverse Section of Broncho-vascular System, contrasting the Healthy with the Diseased State.



A. In a state of advanced disease. A. Artery, partially occluded by a thrombus. B. Bronchus, contracted and plugged. V. Vein. C. Common broncho-vascular sheath, thickened by exudation. I. Interlobular tissue. P. Lobular parenchyma.
B. A corresponding broncho-vascular system in health.

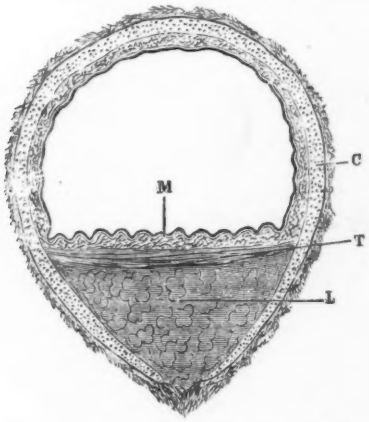
The microscopic examination of the plug which fills the bronchi of the diseased part shows that it is made up of amorphous or finely granular material, and of a great variety of elements, in varying quantities and different stages of destruction. Among these are found quantities of columnar epithelial cells, all of which are granular, and may be broken. On some of them cilia may still be recognised. There are also great numbers of large indefinite granular cells which contain a distinct nucleus. Blood-cells and discs are also found—in some cases the quantity being enormous. Besides these elements are numerous threads of fibrin, and many foreign elements, such as fungi, bacteria, etc.

For some distance along all the tubes in the neighbourhood of the disease the epithelium is greatly changed. Even in those bronchi whose coats are hardly, if at all, altered, the epithelial cells are granular and easily rubbed off the membrane, so that it is almost impossible to make a preparation where they remain *in situ*. In the part where the lung tissue is solid, there is never any epithelial lining to the tubes. The elements of the tissue forming the thickened bronchial wall are found to be pushed asunder by exudation and numerous young cells. The fibrillation of the white fibrous tissue is clouded and obscured, and thick bundles of strong elastic fibres stand out boldly, as

if the tissue had been treated with acetic acid. The muscular part of the wall is very indistinct. The plates of cartilage are unaltered, but are separated from each other, and seem very far removed from the cavity of the tube, considerable exudation having been poured into the submucous tissue.

By making a series of transverse sections, or a longitudinal section, of the bronchial wall, in one of the least developed foci of disease, one can see that the disease of the mucous membrane extends to a greater distance from the diseased centre than that of the bronchial wall or of the peribronchial tissue. Occasionally, however, the lymphatics may be affected to an enormous extent: in one case the disease reached to the trachea, and caused partial occlusion of it, by filling the numerous lymph vessels which occupy the posterior part behind the trachealis muscle (Fig. 3). In these cases the lymphatic glands of the root of the lung are much enlarged, but as a general rule do not become caseous.

FIG. 3.—Surface of Transverse Section of Trachea in which the Lymphatics are intensely engorged.



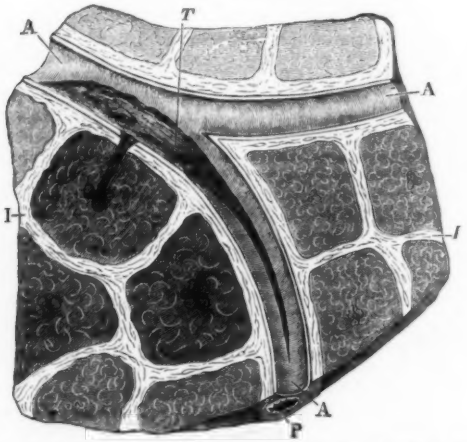
M. Mucous membrane. C. Cartilage. T. Trachealis muscle. L. Connective tissue and engorged lymph-channels.

In speaking of the normal structure of the lung of the ox, I called attention to the very intimate relation between the bronchial tubes and the blood-vessels. They pass along the same grooves in the lung parenchyma, are surrounded by the same sheath of thin connective tissue, and their lymphatics communicate freely with those of each broncho-vascular system, forming one large set of absorbents, which carries all the lymph of the territory supplied by the bronchial tube and its accompanying vessels. It is not at all surprising, then, that as the morbid changes just described are going on in the peribronchial tissue, the sheath of the bloodvessels participates in the diseased action. The exudation encloses the bloodvessels at the same time that it thickens the tissue around the bronchus; so that instead of the three vessels lying in a loose bed of soft tissue, they are encased in a frame, which, enclosing them all, soon becomes so tough and rigid, that they remain patent

cylinders, like tunnels punched out of a resisting substance, such as a piece of turnip (see Fig. 2). The tissue about the bloodvessels is changed in exactly the same way as that around the bronchus, the elements becoming altered in a similar manner.

After a time the walls of the bloodvessels become engorged, the external coat being first attacked, and the other coats in turn becoming thickened and rigid. Often the vessel wall may be increased to several times its normal thickness, and yet the intima looks healthy on the surface. Here and there the intima seems to be also affected. Small red roughened patches are seen on the inner surface of the vessel. The colour seems to depend on staining with the blood contained within the vessel itself. When these rough patches are as large as two or three millimetres across, they are always coated over with a thin pale coagulum. These clots increase in thickness with the increase in size of the damaged patch. Often the intima seems destroyed around the entire calibre of the vessel, or for a considerable extent along one side. In these cases, where the roughness of the intima is extensive, the altered surface cannot be so well seen, as the clot which covers it is very thick (Fig. 4). The vessel is thus partially occluded by

FIG. 4.—Showing Thrombus of Artery.



A. Artery. P. Bronchus. T. Thrombus, tapering off to a fine point of fresh coagulum. I. Interlobular tissue.

a thrombus, which, in the case of small vessels, soon completely fills them with a tight adherent plug. When any vessel is quite occluded, all its branches are found filled with clots of blood, which are often black and soft, evidently being of recent formation. When an extensive plug lies in a large artery without causing its occlusion, many of its minute branches are usually quite stopped. This appears sometimes to depend on small emboli, formed by fragments broken off the thrombus in the parent trunk of the artery. In other cases a number of small vessels throughout the diseased part may be choked up with thrombi, which have evidently been formed

primarily in them, and which seem to be caused by several points of the intima being damaged. Once a branch of a vessel has been filled, the clot seems to grow with great rapidity into the larger branches, so as to produce occlusion of the parent trunk and of the neighbouring branches arising from it.

As may be inferred from what has already been said of the hæmorrhagic consolidation, the parts of the lung parenchyma to which the plugged vessels lead are those thus suddenly engorged. The various appearances met with in the formation of hæmorrhagic infarction are now well understood, so I need not pause here to explain them.* Here the infarction is well marked, but, owing to the many variations in the method in which the coagulation in the vessels may be brought about, there is a much greater variety in its form than is commonly met with in those cases where it depends exclusively upon embolic plugging. The constant conical shape of the black consolidation can now be easily explained, as well as the suddenness with which the engorgement occurs. The variegated appearance produced by small dark-red patches, which is now and then seen on the cut surface, obviously depends upon small scattered infarcts, which result from numerous emboli, or from irregular and diffused injury to the intima of the small vessels.

The chief points of importance concerning the bronchi and vessels may be thus briefly summed up :—

1. The bronchial tubes are always diseased in the region affected with the opaque conical form of consolidation and in its immediate vicinity.
2. The mucous membrane is extensively diseased, the epithelium destroyed, and the bronchus filled with a plug.
3. In this region also the walls of the bronchus are thickened, and its calibre is diminished.
4. The sheath common to the broncho-vascular system is throughout swollen, rigid, and densely infiltrated.
5. The lymphatics of the entire vascular territory are rendered impervious by dense exudation.
6. In the early stages of the affection, the morbid process of the lining of the bronchus is more extensive than that of its wall and surrounding tissue.
7. The walls of the vessels may be implicated and their lining membrane irritated and damaged.
8. Thrombosis may occur at one or several points of the vessels, and cause the occlusion of some of them.
9. Small emboli may break off from a thrombus, and plug several branches of the artery.

* This form of engorgement and hæmorrhage, called by Laennec *Pulmonary Apoplexy*, is now universally admitted to depend on a local impediment to the circulation, such as an embolus impacted in an artery. There being no arterial anastomosis in the lung, such a plug has a very marked effect. The embolus cuts off the normal supply of blood from the part, and the pressure in the arterial branches beyond the stoppage falls to zero. The blood, however, can still find its way through the capillaries into the branches at the distal side of the plug. The branches of the occluded artery are thus reduced to the condition of occluded veins, and as they have none but capillary connections, they may be said to form blind ends to the adjacent arteries. The blood then trickles into these arterial branches and fills them, but no onward flow can take place, therefore they become intensely engorged with stagnant blood. Under these circumstances the inner coat of the vessels is deprived of its nutrition, for which the constant renewal of the blood is required. This starvation of the minute vessels renders them unfit for their function : they lose their power of retaining the blood, which escapes into the neighbouring textures, forming the dense black consolidation now known as *hæmorrhagic infarction*.

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10. The disease seems always to make greater progress in and around the bronchus than around the corresponding vessels.

Conclusion.

In the foregoing pages I have attempted to adhere to a plain statement of facts, as supplied by the notes of the autopsies taken on the spot, and by the examination of numerous specimens which have been sent to my laboratory. I have tried to avoid any expressions which involve theories, and have done little to work out the course of the very interesting morbid changes which form the essence of this disease. Without some effort, however, to follow the order in which the various pathological events occur, the description of the appearances would be barren of interest or utility. I shall therefore now try to trace the sequence of the morbid processes; thus the order in which they occur may be ascertained, and possibly the initial stages of the affection arrived at.

As may be seen from the brief summary of the views held on this subject, which was given in the beginning of this paper, it seems generally agreed that the pleura, or the subpleural and interlobular tissue, is the part first attacked. Although I commenced work with this idea firmly fixed in my mind, I cannot make my observations coincide with such a view, and I think many of the facts enumerated show that this cannot be the case.

In the attempt to trace each lesion to its exciting cause, I have, in every instance, been obliged to pass from the pleural surface towards the deeper parts.

If the pleura were the starting-point of the disease, we ought to find the entire of the membrane, on one or other side of the chest, affected evenly throughout. Such is the common course of acute affections of the pleura, and the inflammation in this disease is generally of such an acute type that twenty-four hours would suffice for it to spread over the entire membrane. But I have invariably found that the pleural inflammation is either localised to the place where the lung is diseased, or is much more developed at that point.

With such acute Pleurisy as is often found, a case ought surely now and then to occur where intense fever and constitutional disturbance would lead to the early recognition of the disease, and call for the immediate slaughter of the beast; and if the pleural inflammation were really the initial step in the disease, we might fairly expect occasionally to find a case in which Pleurisy was the only part of the affection as yet developed. But this is not so: I have never seen or heard of a case in which Pleurisy alone existed. The lung tissue is always diseased to some considerable depth. I have found, on the contrary, that the typical changes may occur in the lung, without any trace of pleural inflammation.

In the common run of cases, where Pleurisy is associated with extensive disease of the lung, the latter always gives the impression that it is of much older standing than the pleural affection. The Pleurisy is commonly acute, while in the lung we usually have evidence of such chronic changes as would require a very long time for their development. From comparing the lung lesions with the clinical history, I have often been forced to conclude that the disease had existed for a very much longer time than was believed during the life of the animal. In one case, where the cow was described as having been in perfect health three days before I saw the lungs, and was said to have given nine quarts of good milk the day before, I found lesions in the lung which, I think, must have taken at least six weeks for their production, associated with the first stage of intense Pleuritis. Another cow, which was said to have been well, and milking five days before death, had a condition of lung which I cannot imagine could be developed under four or five months.

Here there was also recent acute and extensive disease, engaging the entire of the left pleura.

The duration of the clinical history usually corresponds with the stage of development of the Pleuritis, and never with the disease of the lung. I am convinced that the lung disease usually exists for months without being suspected, and invariably the beast is first thought to be sick only when the affection has spread to the pleura, and caused intense inflammation of that membrane, with its accompanying well-marked symptoms. And I believe that if our diagnostic powers were improved, cases of Pleuro-pneumonia without Pleurisy would more frequently be met with.

In thus asserting that the pleural lesion is secondary to that of the lung, I do not mean to imply that the lung parenchyma cannot under any circumstances become secondarily affected from the pleura covering it. It will presently be seen that nothing is more common than this spreading of the disease from the pleura to the subjacent tissue. It can be seen in every case where the inflammation of the pleura is severe, and has lasted some little time. The infective process may be communicated from the primarily affected lobe to its neighbours, by means of the intervention of the pleura; and in these cases the pleura does seem to be the starting-point of the processes in the lobes, which are thus secondarily engaged. But if the primarily affected lobe be carefully examined, it will always be found to contain a wedge of typical marbling, extending towards the root of the lung, with the bronchi and vessels diseased in the manner already described. In this deep-seated, conical, indurated region, the morbid process is more developed than elsewhere. And it is such a centre, I believe, that forms invariably the original point of disease. One such focus, at least, can always be found in some part or other of a diseased lung, no matter how extensive the wide-spread shallow pleural infection may be. To me it seems impossible to explain this chronic, old, indurated part of the lung disease as a result of the acute, recent Pleurisy.

On the other hand, there is no difficulty in explaining the Pleuritis as a result of the lung lesion. In many of the cases slaughtered immediately after the development of the pleural inflammation, this relationship is most obvious. Putting aside the existence of any specific form of infective material, the irritation and inflammation of the pleura may be explained by the mere mechanical injuries done to the membrane by the swelling of the subjacent lung during the disease. To this exciting cause may be added defective lymph drainage and impaired blood supply.

In the cases where the pleural disease is associated with hæmorrhagic infarction—and these are remarkably common—of course there can be no difficulty in explaining the Pleuritis. The pleura may be torn; some blood may escape into its cavity and set up general inflammation; and the part of the membrane corresponding to the infarction is always cut off from its supply of normal nutrition.

There can be no doubt, however, that in the tissues affected by this disease there must exist, or be produced, some material with infective properties, and therefore there can be no difficulty in finding a cause of the inflammation of the susceptible serous membrane.

I am thus forced to believe that the Pleurisy is invariably secondary to the disease of the lung parenchyma. The next question, then, must be, What is the immediate cause of the pulmonary lesion?

It has been said that different kinds of morbid changes are found side by side in the lung, the immediate exciting causes of which must be quite distinct. The most constant of these is the opaque consolidation, which is comparatively deep-seated, and localised to a conical territory, gradually increasing in extent and induration. A second, the most wide-spread

change, seems to be an interstitial exudation or interlobular Pneumonia starting from the pleura, or from the last-mentioned lesion. A third, perhaps the most distinct and striking, is the black hæmorrhagic infarction.

The immediate exciting cause of the last-mentioned morbid process seems clear enough. We know that, when the lining membrane of a bloodvessel is injured, the blood coagulates at that point, and this coagulation increases if the irritation continues to destroy the smoothness of the inner coat. Thus we have thrombosis, leading to vascular plugging. The *modus operandi* of vascular occlusion in causing hæmorrhagic infarction of the lung is now well understood, and has already been referred to (see p. 109). It only remains, then, to search for the origin of the irritation of the vessel-wall in order to complete the pathogeny of this lesion.

A ready cause of the disease of the wall of the vessels is afforded by the engorged state of the peribronchial lymph-vessels. The entire broncho-vascular system is surrounded by one set of lymph-vessels, through which the irritative processes can penetrate with great facility (see Fig. 2, p. 106). When the lymph-channels around the vessels are thus engorged, one can easily understand how the chronic inflammatory processes infect their proper walls, and finally reach the intima.

There appears no reason to doubt that this chronic inflammation, which takes place in the connective-tissue sheath of the broncho-vascular system, is the immediate cause of the great thickening of the walls of the vessels, which always precedes, and is more extensive than, the injury to the inner coat. And there does not seem the least reason for supposing that the disease of the vessel wall precedes that of the surrounding tissue. On the contrary, such an idea is rendered most improbable by the fact that the neighbouring parts are always more extensively diseased than the vascular wall, the inner coat being the least affected, and often escaping altogether. These points will appear more obvious when the course of the bronchial lesion is discussed.

Both the other forms of consolidation obviously depend upon causes quite distinct from that which induces infarction ; and, moreover, a little consideration shows that the mode of commencement of one of these is very unlike that of the other.

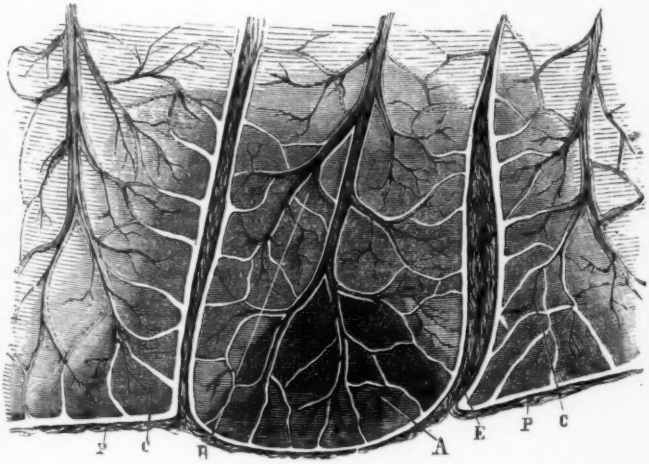
The clear exudation is always more wide-spread and superficial, less solid and less defined, than the opaque induration. The tissue elements remain normal even after the exudation has become intense. The vessels and air-passages are pervious and little altered. It might be described as intense inflammatory œdema, while the other may be termed croupous consolidation. From the distribution and relations of this clear exudation, it appears certain, as just stated, that it is the result of infective action spreading, by means of the lymph-vessels, from the inflamed pleura, and along the broncho-vascular system. But I have already stated that the pleura cannot be said to take the initial step in the disease, so we must look for some other cause of the dense opaque consolidation, which certainly does not depend upon pleural infection.

The first thing that strikes one as remarkable about this form of lung-lesion, is its shape. This always is the same as that of the territory supplied by the broncho-vascular system which enters at its deepest part. In this respect it bears some resemblance to the infarction. In the case of the latter, however, its mode of production and its cause explain its shape, but the bloodvessels in the young cone of opaque consolidation are, as a rule, healthy and pervious, and therefore can throw no light on the matter.

Let us examine what changes are constant in this cone. By making a fair section directly through the centre of a small isolated focus of the dense pale induration—and to such a stage of the disease we must look to learn its initial

steps—three important facts become obvious: first, that the air-cells are filled with croupous exudation; secondly, that the bronchial tube and its branches are plugged with a dense, adherent, fibrinous mass; and thirdly, that all the lymph-vessels around these air-tubes are swollen and turgid, being the seat of a dense fibrinous exudation. Looking at such a specimen, one cannot avoid being impressed with the idea that the occlusion of the bronchus and

FIG. 5.—Semi-diagraphic Sketch to illustrate the mode of extension of the Disease. (A portion of three neighbouring lobes is shown.)



The darkest part of the central lobe (A) is the starting-point (*opaque consolidation*): the lighter part of same (B) shows extension of the *clear exudation viâ* bronchial lymphatics (C) by means of the pleura (P). E. Pleural exudation. (Reduced to one-fourth.)

the engorgement of the lymphatics immediately surrounding it, must be the cause of the lobular consolidation and the interlobular exudation. The more I have tested this view by careful scrutiny of the diseased parts, the more firmly convinced I am of its truth and importance in explaining the first steps in Pleuro-pneumonia. I am at a loss otherwise to understand the peculiar localisation, the sharp demarcation, and the conical shape: all of which are such constant characters of the opaque consolidation, particularly in the early primary nodules of the disease; but, if this view be correct, they are all easily accounted for.

A focus of opaque consolidation being once established, there is no difficulty in accounting for the clear exudation which so constantly surrounds it. When once the broncho-vascular set of lymph plexuses have become the seat of this irritating exudation, it is easy to imagine how they will facilitate the spread of the disease. Encompassing the bronchus, they lead the infective material to irritate its coats, and cause them to undergo a kind of chronic destructive inflammation. At the same time, travelling along the lymphatics towards the root of the lung, the inflammatory process comes upon the tributary broncho-vascular systems, chokes their lymph-passages, and thus produces

interlobular exudation throughout the territory from which they come. There is no difficulty in working out a great variety of ways in which the disease may be spread through the lung by means of the peribronchial lymph-vessels on the one hand, and those under the pleura on the other; the former leading the infective process to the root of the lung, the latter extending it over the surface of the organ. Thus the soft translucent form of exudation may be spread in two ways—viz., by the subpleural and by the peribronchial lymphatics. This would sufficiently account for its irregular outline and indefinite distribution.

But, even admitting that the irritative change in the peribronchial tissues is the cause of the thrombosis and consequent infarction, and that it also takes a great share in the production of both forms of solidity of the lung parenchyma, we have made but little way towards finding out the starting-point of the disease. The occurrence of the peribronchial exudation remains to be accounted for, and its exciting cause must be discovered before we can speak of the first step in the morbid processes, without which the life-history of the disease is deficient in the most vital point.

There seems every reason to believe that this is a process which goes through the same series of events as chronic inflammation, such as would follow any form of persistent irritation, and lead to intense induration. It is needless to go into the much-vexed question whether this be an inflammatory disease or not; authors differ not only amongst themselves, but even with themselves, upon this point. We only know inflammation as a certain series of phenomena occurring in a certain order. We meet these same phenomena in the same order in Pleuro-pneumonia, and we must find a more satisfactory explanation of its peculiarities and divergence from ordinary inflammation than the simple statement that it "is not inflammatory in any of its stages, and never presents any of the phenomena which are associated with inflammation."

In the parts where the peribronchial exudation is most firm, and the tissue most densely infiltrated with new cells, the proper walls of the air-tube are invariably much thickened, and show signs of long-standing disease. The lining membrane of this part of the bronchus is also quite destroyed by a process of ulceration, the epithelial cells being cast off, and forming part of the plug which fills the calibre of the tube.

In those cases where there has been but little time for the disease to spread by the lymphatics, the destruction of the mucous membrane is more extended than the thickening of the peribronchial lymphatics. In short, the mucous membrane seems more extensively diseased than any other structure, in the very early stages of the affection.

From this it would appear that the irritation of the peribronchial lymph-channels is produced by a form of chronic inflammation in the structure of the bronchial wall, which is brought about by the disease of the mucous membrane.

So constantly have I met with this condition in the opaque parts, that I have but little hesitation in affirming that the disease commences in the air-passages as a chronic inflammation, associated with destruction of the bronchial mucous membrane. I cannot say what is the exact size of the tubes in which the inflammation begins; it seems likely that the lobular bronchi are those most readily affected, and certainly the very small tubes are invariably attacked even when the disease is in its most recent stage. The impression left on my mind is, that the delicate lobular bronchi are those first attacked in the majority of cases, though often the morbid processes are more striking in those tubes about the size of a quill.

As to the immediate exciting cause of this strange form of Bronchitis, little can be said. No light is thrown on the subject by the morbid anatomy,

no constant specific elements have been found in the affected part. The etiology of the disease must be studied clinically and experimentally. The only suggestion I should presume to make upon this subject, is a plain deduction from the reading of the pathological events as I have traced them out; it is this—that Pleuro-pneumonia being a local disease, starting in the bronchial mucous membrane, it can only be produced by direct and immediate infection of that membrane, and it is little to be wondered at that inoculation of the tail, or other part, cannot produce the local disease in the lung, though it may set up, in the part operated upon, a form of progressively infective inflammation, which runs a course not unlike that of the lesion of the lung. I have had many opportunities of satisfying myself that when a tail is "successfully" inoculated the subcutaneous connective tissue undergoes a change exactly like that between the lobules of the lung, and the infective process rapidly spreads by the lymphatics.

I can well understand how a beast, by sniffing the fodder of a diseased neighbour, may draw into its air-passages some of the dried discharge, and thus infect its bronchial mucous membrane and get Pleuro-pneumonia; while all the skill science can apply will not induce the disease of the lung by mediate contagion—*i.e.* the inoculation or injection under the skin or into the vessels of infective material procured from a diseased lung.

Whether there be any special virus which acts as the specific cause of this disease or not, must also be left to experimental inquiry to determine positively. I have searched in vain for a morphological element which could be regarded as the *materia peccans*. However, the general aspect of the morbid processes gives one the idea that some peculiar infective product is at work. In very many cases foreign elements, so peculiar as to provoke suspicion, have been found; but further investigation failed to bring home to them the necessary pathogenic properties, as they have generally proved to be inconstant or harmless substances, whose presence is either accidental or unimportant.

The fact that no morphological representative of an infective material can be found, is no proof that it does not exist. How long is the list of diseases which are acknowledged on all sides to depend on the presence of a peculiar virus! How very few—if there be any—of these specific materials do we know in any other way than by the effects they produce! Some, we know, cause a general affection of the blood, some a peculiar primary local lesion and subsequent general infection, others again give rise to a purely local inflammation with a specific character. In the latter category I am inclined to place the virus of Pleuro-pneumonia. When applied to the bronchial mucous membrane, or introduced into any lymph-bearing tissue, it sets up chronic inflammatory changes associated with excessive exudation. Ordinary inoculation illustrates this perfectly. The operation causes practically no inflammation; but after a definite period of incubation, varying from ten to fourteen days, a local specific inflammation is produced in the connective tissue, though this is not accompanied by any constitutional disturbance, except when it spreads extensively; timely amputation of the tail, however, usually prevents this unfortunate accident, and the animal quickly recovers without having any traces of a blood-disease.

I abstain from attempting to discuss the many abstract questions or theories which have from time to time been introduced into the study of this peculiar affection: whether it be real inflammation, or some mysterious specific change differing from all other diseases; whether it be comparable with any human disorder; whether it be zymotic or not, etc. These are very interesting speculations, but their consideration is not very likely to lead to any immediate practical result; and therefore it appears to me more profitable to attempt to unravel the intricate sequence of pathological events,

and trace the successive steps of the morbid changes which occur in Pleuro-pneumonia, for I am satisfied that it is along this track we must travel, if we hope ever to arrive at the true pathogeny of the disease.

To recapitulate, then, the various items in the pathological sequence may be thus enumerated :—

1. Irritation of the mucous membrane of the smaller bronchi, probably by some infective material (specific virus ?).
2. Chronic ulcerative Bronchitis, localised to a few minute bronchi.
3. Occlusion of the affected air-tubes.
4. This produces such changes in the air-cells belonging to the affected tubes that the lobular parenchyma becomes solid.
5. As the bronchial disease progresses, the walls of the air-tubes become thickened and infiltrated with the products of chronic inflammation.
6. The peribronchial lymphatics are implicated by the extension of the infective process from the bronchus, and are soon filled with dense exudation.
7. The block in the lymphatics of the broncho-vascular system impedes the flow of lymph from the corresponding territory.
8. The tributary lymph-channels are thus mechanically engorged, and at the same time they are irritated by infective materials.
9. The inflammation of all the coats of the air-tube gradually spreads towards the root of the lung.

Thus we have a deep-seated cone of typical consolidation, traversed by numerous wide whitish lines, corresponding to the swollen interlobular connective tissue (marbling). In fact, the essential features of the disease are all established.

The morbid process seldom stops here, however. It spreads in two ways.

First, by the broncho-vascular lymph-passages :—

1. The irritating and infective materials find their way along the lymphatics towards the root of the lung, following the normal course of the lymph stream.
2. The wall of the bronchus becomes affected after a time by the irritative matter in its surrounding lymphatics.
3. The lymphatics of tributary bronchial tubes, met with as the disease thus advances, are choked, and the drainage of their territory impeded.
4. The interlobular lymph spaces of the newly affected territory soon become filled with exudation. Thus the clear kind of consolidation is produced.

Secondly, by the pleura :—

1. The pleura becomes affected over the focus of consolidation by means of the subjacent lymphatics.
2. The pleurisy soon extends far beyond this limited region, or the serous membrane becomes generally inflamed.
3. From the inflamed pleura infective materials reach the lymphatics beneath it, and also those lying between the neighbouring superficial lobules.
4. Extending along the interlobular lymphatics, the irritation and exudation may pass towards the deeper parts, so that an immense tract of lung is converted into a semi-translucent mass with swollen interlobular spaces.

The consolidation formed in any of these ways may become intense induration, if the animal live long enough.

With regard to the origin of the disease of the vessel wall, we must also start from the peribronchial disease.

1. The lymphatics of the bronchus readily allow the morbid products to pass to those immediately around the vessels.

2. The wall of the vessel becomes greatly thickened by chronic inflammatory products.

3. The inner coat—which resists the disease for some time—ultimately becomes diseased in small patches.

4. The blood coagulates over the diseased inner coat, and may occlude a small branch at its origin, or even the entire vessel.

5. Particles of the clot may break off, and, passing into the minute arteries, form there embolic plugs.

6. Thus numerous arteries of varying size may be stopped up.

7. The most varied forms of hæmorrhagic infarction are thus produced.

8. The infarction may become gangrenous, cheesy, or may dry up into a crumbling mass.

9. A capsule may form around the most diseased part, and shut it off from the rest of the lung.

If asked to give a pathological definition of Pleuro-pneumonia, I should say that it was a chronic, specific, local disease, starting in the bronchi, and insidiously implicating the parenchyma of the lung, by occlusion of the bronchi and inflammation extending along the lymphatics : the other organs and the blood possess a singular immunity from the specific contamination. It is not accompanied by constitutional symptoms, and only gives obscure physical signs. At any time during the progress of the disease its existence may be manifested clinically, by the occurrence of complications—acute pleurisy or hæmorrhagic infarction with pleural inflammation—which excite high fever, with various functional derangements.

AN EPIZOÖTY OF ANTHRAX AMONG ANIMALS IN SICILY.

Veterinary-surgeon Chicoli, in *Il Medico Veterinario* (March, 1876), states that during the warm season in 1875, there appeared in the district of Corleone, Sicily, an epizoöty of Anthrax among the mares at pasture. This outbreak offered the curious peculiarity, that in all those attacked the Anthrax was localised on the udder. The disease commenced in May on the mares which were grazing, and in a very sudden manner ; it was also extremely rapid in its course, as the first attacked perished in three hours from the moment of invasion. Indeed, so sudden was its onset, so rapidly fatal was it, and so quickly did the mammary swelling appear and spread, that the farmers thought their mares had been bitten by snakes. This supposition, however, was soon disposed of by the extensive spread of the malady, which led to Chicoli being consulted. He visited the infected district in June, and at once recognised the disease as Anthrax Fever, with its *cortège* of local and general symptoms. On the day of his arrival, two mares which were suckling suddenly went off their milk, the teat became swollen, and they died—one in the evening, the other during the night. On examination of the carcases next day, all the lesions of Anthrax were found to be present, but *no Bacilli could be discovered in the blood.* And yet it was impossible to deny that the disease was Anthrax, for reasons which will be mentioned hereafter. Removal from the infected pastures was recommended, acidulated and tonic drenches were given, and the mammary tumours were treated with the actual cautery as soon as they appeared. By these preventive and curative measures the disease gradually disappeared, but the owners complained of the damage done by the serious sloughing that followed the local cauterisation and rendered convalescence very tedious.

They also reported that nearly all the foals and young mules whose dams were diseased, died unless they were immediately removed.

The malady which had been subdued among the horses broke out in the month of August among the bovines which had been driven into the infected pastures to eat the grass left by the mares. Anthrax—well known all over Sicily—was at once diagnosed, though among the cattle there was only Anthrax Fever, and no external local manifestations as in the equines. Chicoli observed also that the left hypochondrium was abnormally tense—evidently from the enormously enlarged spleen found after death. The blood contained an immense number of *Bacilli*, and the leucocytes were more numerous, while the red corpuscles were much distorted. The same preservative measures were adopted as for the horses, and the cattle were driven to another pasture. But ignorant or greedy farmers drove into the infected pasture some three hundred head of sheep, and in *six days* after, indications of Anthrax infection appeared among some of them; these perished with all the usual symptoms of Anthrax, complicated, as is the case in sheep, with nervous disturbance. With these animals, as with the cattle and horses, the disease always assumed a very acute type, and its course was excessively rapid.

After describing these outbreaks, Chicoli reviews what may be the causes of the frequent appearance of Anthrax in Sicily, and he is inclined to believe in its primary spontaneous development and its subsequent propagation by contagion. *There are*, he says, *a certain number of diseases which are completely unknown in the island, and among these Glanders in horses and Pleuro-pneumonia in cattle;* but this is not so with Anthrax, the spontaneous development of which is the result of climatic conditions of the country, and the pastoral system in fashion during the greater part of the year.

In the spring-time there are torrents of rain, followed by an excessively hot season, during which the Sirocco prevails, and dries up everything, causing the disengagement of miasmata which engender the disease in question.

In concluding his observations, the author arrives at the following conclusions :—1. The Anthrax epizoöty of 1875 has been remarkable for the exclusive and constant localisation of the tumours in the mammæ of the mares—an occurrence which he had not witnessed during twenty-seven years' experience. No mention is made by Chicoli of the horses, as in Italy they are not castrated, and are therefore not allowed to pasture. 2. The infecting agent has strong powers of preservation, as notwithstanding a temperature of 32° (Cent.) and the breath of the Sirocco, it continued its ravages. 3. There is reason to believe that this agent exists in the nasal mucus, saliva, and other fluids, and that it cannot be very volatile, inasmuch as the pastures adjoining those in which the disease prevailed so severely escaped a visitation. 4. The absence of *Bacilli* in the blood of the horses, and their presence in that of the cattle, leads to the inquiry as to whether these organisms are the cause or result of Anthrax. 5. The rapidity with which the disease runs its course militates against the success of therapeutic measures; so that it is more desirable to prevent it in acidulating the drink of animals by hydrochloric acid—highly recommended by Chicoli—and in immediately evacuating the unhealthy pastures. 6. Cauterisation, notwithstanding the sloughing it occasions, is one of the best measures to employ in the treatment of localised tumours.

Abstract of the Proceedings of the Royal College of Veterinary Surgeons, Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

QUARTERLY MEETING OF COUNCIL, HELD JULY 11TH, 1878.

Present—The President in the chair; Professor Williams, Messrs. Balls, Batt, Blakeway, Broad, Cartwright, Collins, Cox, Cuthbert, Dray, Fleming, Freeman, Gowing, Morgan, Taylor, Williams, Withers, and the Secretary.

The SECRETARY read the notice convening the meeting.

The minutes of the last meeting were read and confirmed.

The following letters were read:—1st. From some of the members regretting their inability to attend the meeting.—2nd. From the six Vice-presidents, acknowledging their election. 3rd. From Mr. Woodroffe Hill, of Wolverhampton, presenting to the library of the College a copy of his work on the "Management and Diseases of the Dog," and also Professor Voelcker's three pamphlets. Moved by Mr. DRAY and seconded by Mr. GOWING, that a vote of thanks be awarded to Mr. Woodroffe Hill and Dr. Voelcker for their presentations. Carried.—4th. From Mr. Jenkins, acknowledging the receipt of a letter of the 6th instant, and stating that it would be laid before the Veterinary Committee at their next meeting.

At a meeting of the Court of Examiners of the Royal College of Veterinary Surgeons, held on July 2nd, six students from the Royal Veterinary College passed and received their diplomas, and one was rejected.

At a meeting held for the "Second Examination" on July 3rd, seven passed.

At the meetings held for the "First Examination" on—

July	4th,	8	passed, and 4	were rejected.
„	5th,	9	„ 3	„
„	6th,	8	„ 4	„
„	8th,	8	„ 4	„
„	9th,	5	„ 1	„

Making a total of 45 passed and 16 rejected.

A letter was read from Mr. Francis Maynard, of Romsey, Hants, asking his case to be laid before the Council, and that his fee of three guineas be refunded to him.

The SECRETARY explained that Mr. Maynard had had a severe attack of measles in April, and his medical man advised him not to come up before the Board. Since then he had been rejected at the preliminary examination of the Royal Veterinary College.

After some conversation, the PRESIDENT ruled that Mr. Maynard be allowed to come up for future examination for the fee he had already paid.

A letter was read from Mr. John R. Miscamble, of Melbourne, Victoria, asking whether he could obtain a diploma and be admitted a member of the Royal College of Veterinary Surgeons without coming to England and undergoing an examination.

The PRESIDENT said it was obvious that such a proposition could not be entertained.

The SECRETARY stated that a student who had been rejected three times and disqualified under the two years' system, had written asking to be informed whether he might enter the Glasgow Veterinary College and pay fees as a new member.

The SECRETARY was instructed to send an answer to the effect that, according to Bye-law 37, no student would "be allowed to present himself before either section of the Board of the Royal College of Veterinary Surgeons, for his first, second, or third examination, more than three times."

The SECRETARY announced that a letter dated 7th July had been received from the New Veterinary College, Edinburgh, in which three students who had been rejected at their "second examination" in April last asked to be allowed to come up in July, as the same Examiners would be present at the "Pass Examination." They considered it would be a great hardship and loss of time if they were not allowed to avail themselves of this second examination.

In reference to this question, the PRESIDENT referred to Rule 46, which states that "No examination shall take place unless there are at least nine candidates for examination." He thought the meaning of the bye-law was that each examination should be considered as separate, and he should so read it himself.

Mr. COLLINS proposed that that reading of the bye-law should stand good, and that the application be refused.

Mr. DRAY seconded the proposition, which was adopted.

The SECRETARY stated that three or four letters had been received from Dr. Dunsmure in reference to the approaching examinations, in which he stated that if all the students came up there would be sixty-nine for the "First Examination" and ten for the "Pass Examination," the latter to take place on the 18th and 19th inst.

The SECRETARY intimated that a letter had been addressed to Professor Simonds from Mr. Farrance in reference to the assumption by Messrs. Stapley and Son, of Eastbourne, of the title of M.R.C.V.S. The son had become a Roman Catholic priest and had gone to the Continent, and the door-plate had still on it the inscription, "Messrs. Stapley and Son, M.R.C.V.S."

In answer to an inquiry,

The SECRETARY stated that the father was not a member.

Mr. GOWING said the question was whether the father sent his accounts out as a member of the College.

Mr. FLEMING observed that the inscription itself was wrong.

Some conversation ensued on the subject, the President expressing his opinion that it was a case with which the Council could not interfere. The Secretary could only adopt the usual course of announcing that one of the parties was not a member of the Royal College of Veterinary Surgeons, and the correspondence could be published in the local newspapers.

A letter was also received from Mr. Lyon, of Forfar, enclosing several alterations and corrections since the last edition of the Register.

The obituary notice was read.

The SECRETARY called attention to the fact that a member of the College in Birmingham had received a copy of the Register; and, although twice applied to, had omitted to send the price of same.

Mr. CARTWRIGHT, who stated he knew the gentleman in question, said he would call upon him and ascertain whether there had been any mistake.

Moved by Mr. DRAY and seconded by Mr. GOWING, "That no Registers be issued unless prepaid." Carried.

The Secretary was authorised to send out the usual number of gratuitous copies of the Register, with the addition of a copy to the India Office.

Election of Examiners for the Fellowship Degree.

Some discussion ensued as to the number of examiners it was desirable to appoint, when it was eventually arranged that four professional examiners

should be elected, and that the Secretary would summon three out of the four,—one of the examiners being for the College of Preceptors.

The vote having been taken, it was found that the following gentlemen were elected examiners :—Professors Williams and Duguid, and Messrs. Fleming and Harpley.

It was decided that the President should fix the date for the examination.

Appointment of Committees for the year.

Finance Committee.—The members of this committee (Messrs. Broad, Balls, Harpley, Moon, Taylor, and Withers) were, on the motion of Mr. Dray, re-appointed, and Mr. Greaves was added to the number.

Publication Committee.—On the motion of Mr. DRAY, Professor Brown and Messrs. Cox and Fleming were re-appointed members of this committee.

House Committee.—Messrs. Balls, Batt, Broad, Harpley and Withers were re-appointed, and, on the motion of the Secretary, Mr. Dray's name was added to the list.

College Fund Committee.—The members of this committee appointed were Professor Brown, and Messrs. Balls, Broad, Gowing, Harpley, and Dray.

Parliamentary Committee.—Professors Simonds and Brown, and Messrs. Broad, Cox, Fleming, Gowing and Harpley were re-appointed, with the addition of Mr. Taylor.

Library Committee.—The members of this committee—Messrs. Blakeway, Dray, and Harpley—were re-appointed.

Report of Finance Committee.

The report states that the vouchers and receipts for payments during the preceding quarter had been examined and found correct ; and that the present liabilities amounted to £134 19*s.* 2*d.*, which the committee recommended should be discharged.

In answer to the President,

Mr. WITHERS, the Treasurer, stated that the receipts were slightly over the expenditure.

Professor WILLIAMS and Mr. MORGAN called attention to what they considered the enormous expenditure attending the examinations in Scotland, compared with those in England.

After some discussion it was resolved "That it should be an instruction to the Finance Committee to furnish details of the expenditure attending the Scotch examinations to the Council at their next meeting."

A recommendation from the House Committee as to the repairing of some worn-out chairs in the Council-room was acceded to.

Definitive orders were given for the providing of soft specimens for the use of the examiners at the various examinations.

Report of the Conference Committee.

The following report and proposed arrangements were submitted to the consideration of the Council :—

"The Committee appointed by the Council of the Royal College of Veterinary Surgeons to adjust terms of agreement with the Highland and Agricultural Society, having received the proposals of the latter body, beg to recommend to the acceptance of the Council of the Royal College of Veterinary Surgeons Clause 1.

"Also Clause 2, except the word 'free' in line 2. As the admission of the holders of the Highland and Agricultural Certificate without examination cannot be effected under the present Charter ; and as the application for and obtaining of a new Charter will involve considerable expense, your Committee think that each member admitted should pay a registration fee of £1 1*s.*,

being the same amount as is now paid for registration by those who pass the examination of the Royal College of Veterinary Surgeons.

"Your Committee recommend the acceptance of Clause 3.

"Also of Clause 4.

"Also of Clause 5.

"Your Committee see great reason to object to Clause 6, and strongly recommend that it be not agreed to. It would create a body with legal rights outside the body corporate."

Arrangements by the Highland and Agricultural Society of Scotland for admitting the Society's Certificate-holders as Members of the Royal College, and terminating the Examinations of the Highland and Agricultural Society.

"1. The Royal College of Veterinary Surgeons to hold the Examination of the Highland and Agricultural Society as sufficient, and to admit their Certificate-holders without further examination.

"2. All the Highland and Agricultural Society's Certificate-holders passed before 1871 to be admitted members of the Royal College free; those passed in 1872 to pay one guinea; and those passed in the following years, to 1878, to pay a sliding scale from two to seven guineas.

"3. Those students now enrolled at any of the teaching schools who may pass for the Society's certificate, to be enrolled members of the Royal College of Veterinary Surgeons on a payment of seven guineas.

"4. That the Society's examinations shall terminate in three years from the time this arrangement is adopted.

"5. The Highland and Agricultural Society agree to the above arrangements on the understanding that the Annual Meeting of the Royal College of Veterinary Surgeons shall be held in Edinburgh once in three years; and

"That if at any time the Royal College of Veterinary Surgeons should apply for a penal clause against persons practising the veterinary art without a legal qualification, the holders of the Highland and Agricultural Society's Certificate shall be exempted from such penal clauses."

The PRESIDENT explained that at the last meeting of the Council a Committee was appointed with extensive powers to come to some arrangement, if possible, with the Highland and Agricultural Society. The Committee had not actually met, but the members had met individually, and came to the opinion that they did not know sufficiently the mind of the Council or of the profession to justify them in doing anything more than feeling the pulse of the Highland and Agricultural Society. He had met the Secretary of the Highland and Agricultural Society about a fortnight ago in Paris, and had subsequently, by arrangement then made, had a conversation with him as to what the Royal College of Veterinary Surgeons would probably concede; and he (the President) suggested to him that he should, on his part, give the terms which the Highland and Agricultural Society wished to have, which had now been laid in a printed form before the Council. He then met Mr. Robertson, and talked over with him what reply the Committee would recommend should be sent to the Highland and Agricultural Society in regard to the terms they proposed; but nothing had been absolutely done in the matter, and the Council were perfectly free to take any steps they chose in regard to the views of the Highland and Agricultural Society and of the Committee. He did not attach much importance to the penal clause; but the object in view was to prevent people from adopting the title of Veterinary Surgeon unless they had the licence for doing so. In talking with the Committee on several occasions, it was thought the scheme would be an entire failure, except the Council were induced to concede such liberal terms as would include in their body the whole of the members of the High-

land and Agricultural Society. Some people might think that the cost was greater than the gain ; but having had some conversation with some gentlemen on both sides of the question, he would give the argument on both sides. If the Council wished to draw in the Highland and Agricultural Society's members, it would be absolutely essential to assent to Clause 1. The Highland and Agricultural Society wished their members to be admitted free, but the Committee did not think that this would be right, because there would be a considerable expense in obtaining a Supplemental Charter in order to admit them, and because members of the Royal College were obliged to pay a fee previous to their being admitted, and the Committee did not see why the Highland and Agricultural members should not pay the same fee. The Committee recommended the acceptance of Clause 3—"Those students now enrolled at any of the teaching schools who may pass for the Society's Certificate to be enrolled members of the Royal College of Veterinary Surgeons on a payment of seven guineas." At first sight he thought that this was wrong. He could not see why they should not pay the same fees as others ; but after a conversation with the Secretary of the Highland and Agricultural Society, he was rather induced to take the other view—namely, to place those who were at the schools of the Highland and Agricultural Society in the same position as those the Council proposed to admit who had passed last Easter. Clause 4 also at first sight appeared to be wrong ; but it was urged strongly that those who were studying at and had joined any school before they passed the Highland and Agricultural Society had a vested right if they chose to be examined by the Highland and Agricultural Society, and he recommended the Council to accept the clause. Clause 5 the Council would in all probability object to, which asked that the annual meeting of the Royal College be held in Edinburgh every third year. Personally he advocated the holding of the meeting there every third year, but there might be some strong feeling against a compulsory adoption of that clause. Clause 6 the Committee objected to, and strongly recommended that it be not agreed to. The Committee were very much in the dark as to what the feeling of the Council was on the subject, and it would be for the Council to say what propositions they would agree to adopt.

Mr. FLEMING said the subject was a difficult one to deal with, and one in which the whole body of the profession was interested. It was injurious to them as a body that a society in Scotland should give degrees, and while they might be anxious to make concessions to the Highland and Agricultural Society, they should take care that nothing was done that would injure the reputation of the profession. With regard to Clause 2, he thought the Highland and Agricultural Society were asking too much in proposing that their certificate-holders passed before 1871 should be admitted members of the Royal College free. He therefore thought that a small registration fee should be charged. With regard to Clause 5, he did not think they ought to be at the dictation of the Highland and Agricultural Society of Scotland as to when and where they should hold their meetings. With regard to the 6th Clause, he did not think it would be right in the Council to entertain it.

Professor WILLIAMS agreed with Mr. Fleming that the word "free" should be expunged from the 2nd Clause. He spoke from practical knowledge of the matter when he said that there was not a single individual holder of the Highland and Agricultural Society's Certificate who expected to be made a member of the Royal College without the payment of the same fee as was paid by those who obtained the diploma of the Royal College. Clause 3 upon the face of it was most objectionable, and he would oppose it, as it would tend to delay the period of union. But as the representative of the Highland and Agricultural Society pressed it, he thought the Council might accept it, especially as it was not probable that any separate examina-

tion would be held after union had been agreed to. The same argument would apply to Clause 4. He believed the interest of the profession would be advanced if the meetings were held in Scotland ; but he did not think the Highland and Agricultural Society ought to insist on their meeting once in three years in Edinburgh. With regard to Clause 6, he thought the recommendation of the Committee on that and other clauses ought to have the warm approval of the meeting, because he was strongly of opinion that they would be acceptable to the veterinary profession. He thought they ought to meet the Highland Society on as fair and liberal terms as possible. He begged to propose, "That the Committee enter into communication with the Committee of the Highland and Agricultural Society on these terms : that the 1st Clause be accepted ; that the 2nd Clause, with the exception of the word 'free,' be also accepted ; that Clauses 3 and 4 be also accepted ; and that Clauses 5 and 6 be not entertained."

Mr. FLEMING seconded the motion. After some conversation, in which Mr. Taylor and Mr. Morgan took part, the motion was put and carried unanimously.

A SPECIAL MEETING

was afterwards held for the consideration and adoption of Bye-law 50.

The PRESIDENT said, that three months ago, in accordance with the general feeling that there should be a good educational status, and a security that that status was possessed by the candidate who came up for the Fellowship Degree, he inserted in Clause 50 "will be required to produce a certificate of graduation in arts at a university to be recognised for this purpose by the Council." It was a well-known fact that all those who had passed the Civil Service or Army examinations possessed the necessary amount of educational status to qualify them for the Fellowship ; therefore, some time ago, he moved that these examinations should be considered sufficient, and he was also perfectly willing to move that any other examination which the Council thought sufficiently stringent should be included. If they were satisfied that a man had a good education, he could not see the object of asking him to go before the College of Preceptors. He therefore proposed to add to Bye-law 50, "or after an examination by the College of Preceptors on subjects to be fixed from time to time by the Council."

Mr. FLEMING seconded the motion.

Mr. MORGAN thought that the bye-law would scarcely meet the point. There was something in the words "or after an examination," which would deter them from coming. Some men would say that they had left school too long to go into grammatical matters. He did not see any necessity for the bye-law at all, and would propose it to be abolished.

Mr. FLEMING said that in that case they might as well abolish the Fellowship Degree altogether. They would be degrading the profession if they admitted men who could not prove that they were fit to read and write their own language. It was absolutely necessary that the public should have some independent guarantee that Fellows were men of education.

Professor WILLIAMS suggested, as a means of meeting the difficulty, the word "undergo" instead of "after."

Mr. MORGAN suggested that the last sentence of Rule 49 should be made to read, "This Special Court shall consist of not less than four members, of whom one shall be a member of the College of Preceptors."

The PRESIDENT thought the suggestion a happy one, and said he was prepared to accept it ; but he thought they should confirm the amendment, because there were some four candidates now waiting to be examined. It would be unfair to the present candidates if the amendment of Bye-law

50 were not confirmed. He was, however, prepared to adopt the further amendment proposed by Mr. Morgan.

The motion for the adoption of the amendment of the bye-law was carried.

The PRESIDENT then gave notice of amendment of Bye-law 49 as follows: instead of not less than "three," insert "four, of whom one shall be a member of the College of Preceptors." Bye-law 50 to be cancelled.

NORFOLK AND EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

ON Tuesday, July 2nd, a meeting in connexion with the above Association was held at the Norfolk Hotel, Norwich, Mr. W. Shipley, the President, in the chair. There were also present—Professor Pritchard, Royal Veterinary College, London; Dr. F. Cufaude, Acle; Messrs. A. H. Santy, F. Low, G. G. Whincop, and L. Butters, Norwich; J. D. Overed, Blofield; D. Rattee, Hapton; F. Augur, Wymondham; R. Howard, Thetford; J. K. Gooch, Holt; H. Newson, Beccles; and S. Smith, Lowestoft. Mr. W. Smith, Norwich (through illness, which, we deeply regret to learn, has since terminated fatally); Mr. J. Hammond, Bale; Mr. W. Ellis, Hempnall, and others, were unavoidably absent.

After the usual routine business had been disposed of, the PRESIDENT delivered a brief practical address, and afterwards requested Mr. Santy to read his paper on the "Diseases of the Horse's Hock," especially with reference to the examination of horses as to soundness, which was of a most interesting character, and received hearty expressions of approval from those present, eliciting, at its close, a most animated discussion, in which Professor PRITCHARD and most of the members took part.

The election of officers for the ensuing year was next proceeded with, and resulted as follows: President—Mr. A. H. Santy; Vice-Presidents—Messrs. D. Rattee, G. G. Whincop, and L. Butters; Treasurer and Hon. Sec.—Mr. J. D. Overed.—Professor Pritchard was elected an Hon. Associate, and the following gentlemen members of the Association: Messrs. W. Ellis, T. Augur, L. Butters, E. Case, F. Case, J. K. Gooch, R. Howard, H. Newson, and S. Smith.

The following is Mr. SANTY'S paper:—

"The subject I propose this evening to draw your attention to is the Anatomy and some of the Diseases of the Hock Joint of the Horse, accompanied by a few remarks on the examination of it as to soundness. I have quoted from various authors, but principally from Percivall and Williams.

"The hock joint of the horse has entering into its bony structure a number of differently-shaped bones—in all, ten. These bones play varied parts: some I should call bones proper to the joint, whilst others I should term accessory. The first, or bones proper, are the astragalus, *os calcis*, cuboid bone, and three cuneiform bones—viz., magnum, medium, and parvum; the latter the tibia and the three metatarsal bones. A minute description of each bone, or in fact any part of the anatomy, it is not my intention to give in this paper, neither will time permit; I will therefore content myself by giving a short outline of each.

"*The Astragalus.*—The bone which supports the tibia, distinguished by its pulley-like formation, divided into superior, inferior, and posterior surfaces. The superior is entirely articulatory; posterior surface irregular, four articulations with *os calcis*; inferior surface smaller than the others, irregular, flattened, almost wholly articulatory, embraced by the superior part of the cuneiform magnum.

"The *Os Calcis* is situated posteriorly, and forms the projecting part called the point of the hock, irregular in shape, divided into body and tuberosity; it articulates with the astragalus and cuboid bone.

"*Cuboid Bone,* situated on the outer part of the hock; form oblong; divided into external, internal, superior, and inferior surfaces; it articulates with the *os calcis,* astragalus, cuneiform magnum, medium, and outer small and large metatarsal bones.

"*Cuneiform Magnum* is situated immediately under the astragalus, divided into superior and inferior surfaces, sides and angles, flat above and below. The superior surface is entirely articulatory, with the exception of a groove running to its middle from the outer side; inferior surface rather more convex than superior; it articulates with the astragalus, cuneiform medium, parvum, and with the cuboid bone.

"*Cuneiform Medium,* situated under the large cuneiform bone upon the large metatarsal, divided the same as the large bone with which it articulates, also with the cuboid and metatarsal; inwardly this bone, as well as the cuneiform parvum, are sometimes more developed, forming a sort of tuberosity, and may be mistaken for Spavin.

"*Cuneiform Parvum,* situated postero-internal part of the hock, small and irregular; it articulates with the large and middle cuneiform bones, and with the large and internal small metatarsal bones.

"Of the bones accessory to the formation of the hock joint we have the tibia and three metatarsal bones. The tibia—situation between the stifle and hock—divided into body, superior and inferior extremities. The inferior extremity, the only part I shall notice, is flattened and spreading, but little wider than the body itself, consists of two deep articular grooves, running obliquely from before backwards and from without inwards, and of three sharpened projections; one extending obliquely forms the projection between the grooves, the others form the lateral processes, of which the internal is the more prominent, both being roughened for the attachment of the lateral ligaments. The external lateral process has a groove for the passage of the tendon of the peroneus; it articulates inferiorly with the astragalus.

"The large metatarsal bone, situated between the hock and fetlock joint, divided into shaft, superior and inferior extremities. On the superior is a prominence for the attachment of the flexor metatarsi, and at the superior and outer part is a groove for the metatarsal artery.

"*Small Metatarsal Bones*—long, slender, and irregular—situated on either side of the large metatarsal; the outer bone is the larger of the two. The articulations have already been described.

"Of the *Soft Structures* entering into the formation of the hock joint, I may mention first those that are attached to the bones of that joint, then those which pass over or are connected with it as a whole.

"Of the *Ligaments,* which are numerous, especially the interosseous and transverse, there is one ligament—the calcaneo-cuboid—which I shall notice when speaking of Curb; there are four capsular ligaments to the calcis with astragalus—one capsular ligament to each bone, and one to each isolated articulation—and two pairs of crucial ligaments. There are four annular ligaments to the hock—three in front and one posteriorly.

"Of the *Muscles* attached to the bones of the horse's hock, two are very powerful, one as a flexor, the other as an extensor; the third is accessory to the latter.

"*Flexor Metatarsi.*—Situation, antero-internal side of limb; attached superiorly to the external condyle of the femur, inferiorly to the head of the large and internal small metatarsal bones. Action, to flex the hock.

"*Gastrocnemius Externus.*—Situation, superficial along posterior part of the leg; attached superiorly just above external condyle of femur to inner

condyle and ridge extending from it, inferiorly to the point of the *os calcis*. Action, to extend the hock.

"*Gastrocnemius Internus.*—Situation, posterior part of leg. Attachment, superiorly to the upper part of the roughened hollow, above the external condyle of femur; about the middle of tibia it winds round the gastrocnemius externus, reversing the relative position; when it reaches *os calcis* it forms a cap to that bone, sending off two strips of tendon to be attached to it. This is one of the most important muscles in connection with the hock, as at this part it forms a sort of joint with the point of the *os calcis*; it is lined with a membrane secreting synovia. When it gets below the hock it takes the name of *flexor pedis perforatus*, and becomes attached to the *os coronæ*. Action, to extend the hock and flex the fetlock and pastern.

"*Plantaris.*—Situation, postero-external part of the thigh, slender in form. Attached superiorly to the head of the fibula, inferiorly to the *os calcis*. Action, to assist in extending the hock.

"Of the *Muscles* connected with the hock joint we have the *extensor pedis*. Situation superficial, anterior part of the leg; attached superiorly to antero-inferior part of external condyle of femur, inferiorly to the coronal process of the *os pedis;* a little above the hock it becomes a flat tendon, which takes its course in front through a theca prepared for it, which binds it down,—in consequence of which, while it is performing its own action of extending the foot, it at the same time has a tendency to flex the hock.

"*Peroneus.*—Situation, antero-external side of limb; attachment, superiorly to the head of the fibula and body of that bone, inferiorly it becomes blended with the tendon of *extensor pedis* just below the hock. Action, to assist the *extensor pedis*.

"*Flexor Pedis.*—Situation, postero-external side of limb; attachment, superiorly to the postero-external side of the head of the tibia, to the posterior part of the body of the bone; inferiorly the tendon assumes the name of *tendo perforans*, and becomes inserted into ground surface of *os pedis*. Action, flexes foot and pastern, and slightly extends hock.

"*Flexor Pedis Accessorius.*—Situation, deep-seated postero-internal part of leg; attachment to the postero-external part of head of tibia; tendon passes down through a groove on outside of hock, and just below becomes blended with tendon of *flexor pedis*. Action, to assist *flexor pedis perforans*.

"Of the *Arteries*, we have the anterior and posterior tibial. The anterior reaches front of the hock, passes under the annular ligament, takes an oblique course to the outer surface, passing in a groove between large and external small metatarsal bones, and becomes the metatarsal. The posterior tibial takes its course down the back of the tibia in apposition to the bone as low down as the hock, and disappears in a number of branches at the hock.

"*Veins.*—The principal is the *vena saphena major*, formed by the anastomosis of the metatarsal and several small veins. Its course is in front of the hock, and passes over the seat of spavin obliquely. The others are the posterior and anterior tibial.

"Of the *Nerves* we have the posterior and anterior tibial. The posterior accompanies the posterior tibial artery down the leg. It is inclined to the inner side, opposite body of *os calcis;* here it divides and forms the metatarsal.

"*Anterior Tibial* dips between the *flexor metatarsi* and *extensor pedis*, taking an oblique direction, then takes a downward course, becomes more superficial, ends in front of hock in cutaneous branches.

"We have the areolar tissue and fascia and common integument.

"The Diseases of the Hock.

"I will first notice those more immediately connected with the soft structures, then those of the bones.

"The diseases common to the hock are Bog Spavin, Thorough Pin, Capped Hock, Injuries to Gastrocnemii, Curb, and Bone Spavin.

"BOG SPAVIN may be defined to be a soft, elastic, fluctuating tumour, of the nature of Windgall, growing upon the inner, upper, and anterior part of the hock.

"Causes are such as produce Windgall in general, to which may be added such as act on the hock in particular, divided into general and local, febrile, rheumatic, and general dropsical affections. Locally, any excessive work or over-weight will have a tendency to stretch or strain this joint—these causes acting more upon the young than the adult animal. Intensity of motion, or any undue stress upon the hock joint, tends to create irritation, if not inflammation of its delicate membrane, the consequence being augmented secretion of synovia, producing what is termed Bog Spavin.

"We not unfrequently find it in young animals that have never been worked, yearlings, and two-year-olds. This form of the disease I cannot think is the result of inflammation or irritation, but consider it as a kind of dropsical affection found in overgrown animals, and those loosely put together. There is an important difference between the pathology of Bog Spavin and Windgall—that whilst the latter has a bursa for its seat, Bog Spavin consists in enlargement and saccular dilatation of the capsule of the joint itself; so that in a state of disease it may contain as much as two or three ounces of synovia, whilst in the normal condition it contains but from three to four drachms.

"The termination of Bog Spavin in general is an accumulation of synovia, a thickening and strengthening of the sac, which may grow to a quarter of an inch in thickness, and frequently when in the young animal a total disappearance of the disease as it gains strength. This accounts for our very rarely finding lameness accompanying it; but sometimes disease proceeds further, and Percivall quotes some excellent remarks from Mr. Pritchard on the subject in the *Veterinarian* for January 1849, in which he informs us he has discovered alterations to have taken place in the synovial fluid. The fluid, he says, becomes highly charged, first with cartilage, then with calcareous matter, and the whole tumour of hock becomes converted into ossific substance. Professor Williams calls this Rheumatoid Diathesis; he says, common inflammation of a joint generally tends to ulceration and anchylosis; the rheumatoid, to calcification of the articular cartilage and synovial fringes.

"*Treatment of Bog Spavin*, in that form in which we find it in the young animal: gentle pressure, in the shape of a stimulating or mercurial flock charge, frequently repeated—that is, as often as possible—with good living, is, in my opinion, the best means of reducing the disease and bringing the hocks to a normal condition. Where it is traceable to any of the before-mentioned causes, and there are symptoms of inflammation, rest, a high-heeled shoe, hot fomentations, cathartic medicine, afterwards pressure by spring truss, or compound iodine blisters, and the actual cautery, which in my experience is a very effectual remedy.

"BLOOD SPAVIN, I will just mention, is a distended condition of the *vena saphena*, caused by the pressure of a bursal or bony enlargement. I have never seen a case of varicosity, although I believe it is stated some have actually existed.

"THOROUGH-PIN may be defined to be a bursal enlargement running from side to side through the upper and back part of the hock.

"Causes.—The same as produce Bog Spavin, the young animal being more susceptible than the adult.

"*Pathology of Thorough-pin* consists in a dropsical state of the sheath of the *flexor pedis perforans*. This may be termed true Thorough-pin, but

Professors Williams and Percivall both state Thorough-pin may be in connection with Bog Spavin—that is, that the bursa of the *flexor pedis perforans* tendon may be distended from the overflow of synovia from the true hock joint, causing a fluctuating swelling that may be felt on either side of the hock, and which we term Thorough-pin. This cannot take place from the bursa to the true hock joint, on account of a cartilaginous disc, situated under the perforans tendon, which prevents the flow of synovia from the bursa.

"*Treatment.*—The same as in Bog Spavin. I have seen the spring truss act well in some cases, in others they have grown larger; repeated blistering applications, a compound of ung. hyd. biniod. and ung. canth. are often very successful in reducing Thorough-pin. I presume that these diseases are unsoundness only according to degree. Supposing a young animal is brought to us for examination, showing signs of Bog Spavin and Thorough-pin, I do not think we should be justified in passing it as sound, and certainly not if any symptoms of inflammatory action were present. As I have before stated, I have seen the disease quite disappear as the young animal gained strength; on the other hand, I have seen them get an immense size, and totally unfit the animal for use. In the adult, where there is, as we often find, a swelling of a slight degree, both in the seat of Bog Spavin and Thorough-pin, if unaccompanied by any inflammatory symptoms or defect in action, I think we may pass them as sound.

"CAPPED HOCK may be defined to be a swelling or fulness on the point of the hock; Professor Williams gives two kinds—the synovial and the serous. He says: "The synovial appears as a tense fluctuating swelling, situated upon both sides of the point of the hock, the tendon of the gastrocnemius internus being posterior to the bursa, which prevents it from bulging backwards. It is an unsoundness causing lameness, and the formation of abscess, from caries or necrosis of the summit of the *os calcis;* it has never been my lot to see such a diseased condition of the parts." The serous Capped Hock is a serous abscess, situated in the areolar tissue, between the tendon of the gastrocnemius internus and the skin.

"Causes.—Any external injury, added to which it may be the sequel of constitutional or disease of other parts, but it then goes or comes according to the severity of those diseases.

"*Treatment of Capped Hock.*—First remove the cause, if possible. When recent, the antiphlogistic is indicated; when all inflammatory action has disappeared, and you have got rid of the cause, preparations of iodine, etc. A stimulating application I have found very useful in the removal of immense capped hocks, reducing them to a minimum, is a compound of equal parts of acidum carbol., ol. lini., and ol. terebinth: apply with friction once every day. It raises a thick scale, without disturbing the hair, and may be applied time after time for ten days or a fortnight, till the scale becomes so thick that it is useless applying it; then wait until it rises, and repeat as before.

"We occasionally get injuries to the *flexor metatarsi* and the gastrocnemii tendons. On these diseases, gentlemen, I will refer you to Professor Williams' work on surgery.

"CURB, as the public define it, is a swelling at the posterior part of the hock (as I heard it defined in an Assize Court by a stableman, 'a bit of a nob at the back of the hock,' and he added that he called it Curb for shortness.) There is a difference of opinion amongst the best authorities as to the real seat of Curb; Professor Williams says it is sprain of the calcaneo-cuboid ligament, and not the cellular tissue or annular ligament. Whoever is right, I think we may correctly follow the late Professor Spooner, in stating that it is neither more nor less than sprain of the fibrous tissue at the posterior part of the hock; sickled hock most liable. It is congenital, being found in foals.

"Cause.—Any act that is calculated to give a sudden stretch or strain to the fibrous tissue; an unconscious movement; galloping over a heavy country is a very likely cause.

"*Treatment of Curb.*—Rest, a high-heeled shoe, reduction of the inflammation, afterwards apply iodine or its compounds, the actual cautery; curbs of long standing, being the remains of former disease, seldom cause lameness, and are considered by some not to be an unsoundness, but in my opinion, in all cases where we can positively affirm there is a curb, the animal is legally unsound.

"BONE SPAVIN.—Definition of it most agreeable to my mind is Percival's —an exostosis of the hock, commonly located and detectable on its inner side, whereby bones, before movable, become cemented and fixed together, and which is sometimes productive of caries of the articular surfaces of one or more of the joints of the hock. Why it should occur on the inside is that it is nearest the centre of gravity, and also from the arrangement of the cuneiform bones, when the hock is flexed the pressure is thrown on the inner side.

"Causes.—Hereditary pre-disposition, peculiarity of conformation, ossific diathesis, growing and overgrown young horses, especially when in the breaker's hands. The local or exciting causes are sprains of the ligaments, more particularly the interosseous; some say concussion of the bones. Professor Fearnley says Spavin is caused by concussion, but it is the concussion of extreme flexion; and this, he says, is why we find it most in horses that have the most hock action, and are so bent as to admit of extreme flexion; he denies that the square and straight hock is often the subject of it. Percival's theory is directly the opposite of this. I must confess that the form of the hock has not much entered my mind; during the examination of them my principal idea has been to enable myself to state whether disease existed or not.

"The mode of *Detection of Spavin* must be left to each examiner, for you will hardly see two examine alike. Professor Fearnley condemns looking for them; and I have heard an army veterinary surgeon say that we ought to be able to tell a spavin by being led blindfold to one hock. We might in some instances; but in the cases that are the cause of dispute, I am afraid we should often be at fault. My own idea is that we require to make use of the sense of sight as well as touch, and thoroughly examine the one hock in comparison with the other; for I have yet to learn that you get such a marked difference in the development without disease. We hear a great deal about the finding or feeling the fissures between the bones. We are able to do this to a certain extent, but when the hock is covered by ligamentous tissue and the common integument we cannot so easily detect disease, or rather be able to state there is a total absence of it, as some would have us believe, especially in the ulcerative form. It is possible for this form of the disease (the ulcerative) to be going on without any other apparent symptom than lameness. If not acute, a decided defect in the action or flexion of the hock, and exostosis, become developed after a lengthened time, perhaps subsequent to treatment of various kinds.

"*Treatment of Bone Spavin.*—To veterinary surgeons I am not aware that I can say anything with regard to it which they do not already know. Counter-irritation in some form seems to be the leading principle; blisters, the preparations of iodine and cantharides, setons, periosteotomy, also what is known by the term 'causticking,' which has been performed with great success by the late Mr. Samuel Fisher, of Stamford, Lincolnshire, and also by Mr. Fryer, of Kirby Fleetham, Yorkshire. Since my residence in Norwich I have tried it on three cases, two with perfect success: one a five-year-old horse, the property of the late T. Edwards, Esq., of Keswick, Norwich; two

this year, one the property of a surgeon in the city, a five-year-old horse, very lame, had been blistered; the former animal also was very lame, but became sound and remained so at work until sold and lost sight of; the latter was operated upon on March 12th. Six weeks after it was sound, but had an iodine blister applied to both hocks, mostly with the idea of causing absorption of the swelling produced by the operation; it was put to work about the 1st of June, and has been going sound since. The third case, a four-year-old pony, about fourteen hands, had been used for harness work; very lame of both hocks, more especially of the off one; great enlargement in the seat of spavin; operated upon on March 5th, had an iodine blister applied six weeks after; put to harness work about the beginning of June, is working to-day with only a slight defect in the action. I think in cases of hock lameness this remedy is worthy of more extensive trial; it leaves very little blemish, and the results, as far as I can speak, are satisfactory.

"The mode, as I am acquainted with it, is as follows: The animal being cast, make a clean, straight, and bold incision through the skin and areolar tissue, from above downwards, just below the seat of spavin, in the triangular-like space formed by the *vena saphena;* then take a probe-pointed seton needle, and raise the skin by working the needle over the spavin backwards and forwards into a pear-shaped space, your incision of course being the apex; then insert tightly some pledgets of tow, or a long piece of thick cotton, saturated with any preparation the operator may think best,—some, I believe, use a solution of nitrate of silver. The medicament I have used has been as given by Professor Fearnley—equal parts of oil of turpentine, oil of cantharides, and oil of thyme. Place as much of the tow or cotton as can be got into the wound, being sure to leave sufficient hanging out to get hold of; let it remain in for forty-eight or seventy-two hours, then withdraw, when there will be a copious discharge. The hocks require no treatment beyond a little fomentation with warm water about ten minutes once a day for a few days; give rest for three months; in some cases I apply an iodine blister about six weeks after the operation.

"Firing may be done in two ways—the line, or puncturing—or combined. I like the puncture firing, and have in some cases punctured quite into the exostosis with good results, applying a blister directly afterwards. In splint it frequently cures without any further trouble.

"Gentlemen, Bone Spavin is to me the principal and most important question in this paper, and the one, I think, in which we, as members of a scientific profession, find most difficulty in arriving at a satisfactory solution. I sincerely trust that the discussion which may follow this reading will enable us to lay down some law, if only to be understood locally (that is, in the county), which will allow us individually to assert that such a hock is the subject of the above disease, with a reasonable belief that it will be pronounced so by our professional neighbours. Professor Williams says that Bone Spavin is a very common cause of lameness and consequent unsoundness, and it is of importance that a veterinary surgeon be a good judge of a hock, for what may be a spavin in one hock may be a mere conformation in another. True, but does the Professor mean the hocks of the same horse? I take it for granted that he means hocks of different animals. This seems to me to contain the whole pith and substance of the subject. Can we, can any member of the profession, be absolutely certain, in giving his opinion, that he is right in stating that in such a hock, although there is an enlargement in the seat of spavin, it is only the natural or peculiar conformation, and that no disease exists; or, on the other hand, be able to state with equal confidence that such an enlargement is, or such a hock is, the seat of Bone Spavin? The latter, I think, there is a good reason for saying we can; the former, I think, is often a very doubtful matter. It is a very simple thing to take hold of a properly

prepared specimen and give a correct opinion as to whether there is a spavin or the absence of it; but in the living animal it is a more delicate matter to truthfully decide if either or both hocks have Bone Spavin. Of course, where there is exostosis existing to the size of a walnut, any tyro can see and tell you the horse has a spavin; but I am speaking of a case that is open to dispute, where there is a difference in the formation and feel of the two hocks of the same animal. If we have one hock decidedly larger than the other in the seat of spavin, it is my opinion that in nine cases out of ten we should find on dissection that such hock was the seat of disease; and those I have dissected have proved it to be so. Therefore I submit to this Association—and I am sure that some very practical and respected members of it will coincide with me—that in all cases where we have one hock larger in the seat of spavin, and where there is no difficulty to an unprejudiced member, or even any person of good observation, in stating such to be the case, we should not be justified in passing such an animal as legally sound; in fact, that we ought to condemn it as being unsound.

"There are many of these cases which we pronounce unsound from bony enlargement of one hock that do not go lame, or so lame as to be brought under our notice professionally, because they are not half tried by severe leaping, draught, etc.; and, again, there are many horses going lame in this city from disease of the hocks, that if you told their owners they were so, you would be put down for something worse than a fool; so that these cases, examined and pronounced unsound, rarely or ever give us the opportunity of demonstrating them to be so by actual lameness or by dissection. Again, with respect to lameness, of course age of animal, age of and position of spavin, have much to do with it. If we get exostosis upon the cuneiform bones, or head of small metatarsal bone, without involving the articulatory surface, we certainly should have disease and enlargement, but if the process was cut short there, it is possible not to have lameness. Gentlemen, if we are examining a horse for ourselves or for a friend for practical purposes, or for a client who states to us that he wishes to know, to the best of our belief, if the animal is serviceably sound, then, in my opinion, we are justified in waiving a great many of the nice little objections which the law, in its present state, bids us take account of; for I must admit that I have known many horses with odd hocks, that I would not pass as sound animals, continue to go so for several years; but, on the other hand, if a horse is brought to us to be examined as to soundness, and our client wants one or other of the two simple words, yes or no, let the responsibility of either of them stare us in the face.

"Speaking of the hock, it is not a question of what the horse has been or may become, it is a question of reality—What is his condition now? We ought to ask ourselves, Can we honestly and conscientiously, and without fear of what any member of the profession may say to the contrary, declare such a hock to be sound or unsound as the case may be? has he one hock larger than the other in the seat of spavin, and from what cause, if so, are we to reject him as being unsound? or is it to be left to the judgment or caprice of each individual member? If so, then I think there ought to be an end of examinations as to legal unsoundness; let every member simply give his opinion as he thinks best, and own that we as a body have no line to go by, that most is hap-hazard, according to circumstances which bear on each man's mind. It is probable that Mr. A. and Mr. B. will pass an animal, whilst Mr. C. will reject him, or *vice versâ*.

"Gentlemen, I have trespassed too long on your time. In conclusion, I will say, as far as I am concerned, and until I have reason to alter my ideas, in the examination of horses as to soundness with respect to Bone Spavin, if a horse were brought to me with hocks both alike in the seat of spavin,

although prominent, showing no signs of lameness, using or flexing them well, such a horse I would pass as sound; but should I be able to say without fear of contradiction that one hock was larger in the seat of spavin than the other, although the animal at the time showed no signs of lameness, as I have before stated, I should consider such a hock to be diseased, and consequently should reject him as being unsound."

Professor PRITCHARD, after passing a well-merited tribute of praise to the essayist, with whom in the main he entirely agreed, as he thought all present would agree, introduced the discussion by remarking that in the detection of Bone Spavin very much depends on comparing one hock of the same animal with its fellow—much more than the comparison of the hocks of different animals, as it is a fact patent to all that the tuberosities and depressions in the hock joint materially vary in different animals: nay, even the small bones entering into the formation of this joint are not always the same in number, thereby altering to some extent its appearance and general contour. With these facts before us, it will at once be admitted that the greatest possible care must be exercised in our examinations of horses as to soundness, and especially with reference to the hocks, in order to form a just conclusion and pronounce a correct opinion when requested to do so. It is not, however, upon the appearance of the hocks that we must alone rely, neither may we entirely depend on our power of manipulation for the detection of Spavin; for even with these aids to our diagnoses we shall occasionally meet with cases very difficult of detection—as, for instance, in ulceration of the articular cartilages, and in internal anchylosis of the small bones of the hock, known as Occult Spavin: in such cases we must look to the horse's action, and his power to flex the hock, as the basis on which to rest our conclusions. With reference to the treatment of Spavin, he would mention the operation (not noticed by the essayist) of dividing the skin and fascia over the seat of spavin with a sharp hot iron (taking care to avoid the *vena saphena*), the beneficial results of which he had witnessed in many instances.

As to the pathology and seat of Curb, Professor Pritchard's investigations led him to differ somewhat from the opinions of Professor Williams, and also the late Professor Spooner. On a careful dissection of a hock affected with Curb in the first stage of development, lymph, as a product of inflammatory action, will be found deposited between the posterior annular ligament and perforatus tendon; and if this is the part, as he contended, where the abnormal action commences, and where the deposition of lymph takes place, he thought we are right in concluding it also to be the seat of disease. In examining for Curb, our attention must be directed to the exact centre of the posterior aspect of the hock, otherwise we might be led into error by the appearance of the head of the outer small metatarsal bone, which by its large development in some instances has been mistaken for Curb. With regard to the treatment of Curb, he had nothing material to add to the advice given by the essayist.

Referring to the treatment recommended for Bog Spavin and Thorough-pin, the Professor said he was not in favour of blisters, which frequently increased the enlargement—the increase in some instances being very marked and rapid, and afterwards very difficult to reduce. The application of the spring truss, to be of service, requires great nicety of adjustment, so as to produce continued and equable pressure; or excoriation and probably a blemish would result, necessitating the removal of the truss and in many instances the re-appearance of the enlargement.

An eminent veterinary surgeon advises the administration internally of small and repeated doses of hydrarg. chlor., but as its use was attended with risk, he (the Professor) could not recommend the treatment for adoption.

As a topical remedy, firing was probably as successful as any treatment that could be advised.

Mr. SHIPLEY quite agreed with the Professor as to the great care with which examinations of the horse's hock should be conducted: in doing so, too much confidence should not be placed in the touch, nor in the appearance of the joint, but a due regard to both these, with a careful observation of the power to flex the part, would be necessary, and then we should not always succeed in arriving at a perfectly satisfactory conclusion, and one that was entirely free from doubt. Well-known instances had occurred of acute lameness, without enlargement, which continued for a long period, even after the usual treatment had been applied. A case in point occurred in his practice, in which two years elapsed before any enlargement could be detected—the animal suffering acutely the whole time, notwithstanding that treatment, including firing, had been prescribed.

As to what constitutes unsoundness, it was still a vexed question amongst members of their profession. An enlargement on each hock, unaccompanied with lameness, pronounced a spavin by one individual, would be looked upon as simply congenital by another; the difference being this—in the former case the horse would be unsound, and worth perhaps half his original value, in the latter case neither in usefulness nor value would he materially suffer. Where only one hock was so affected, this difference in opinion was less likely to arise: a unanimous verdict of unsoundness would probably be pronounced; but where both hocks were implicated he had proof that it was unsafe to decide in favour of soundness. On one occasion he most carefully examined a fine young horse for a good client, the hocks of which, though somewhat prominent at the inner side, were pronounced by him as sound. On the faith of this opinion the horse was bought and put to work; he went sound for a time, but in six weeks became dead lame and subsequently perfectly useless. From these facts he argued that not only where one hock was larger than its fellow, but also where both hocks were enlarged and presented a suspicious appearance, it was the duty of the examiner to take a prospective view, and pronounce the animal unsound.

With reference to the treatment of Thorough-pin, he was much surprised at Professor Pritchard's remarks as to the ill effects of blisters: in his practice they had generally resulted satisfactorily; but he could not speak favourably of the spring truss,—its use in his hands had seldom been successful, and in some cases the enlargement had much increased.

Dr. F. CUFAUDE asked the essayist if he had rightly understood him to say that in Bog Spavin the synovia in the hock joint was usually increased from two or three drachms to as many ounces. In the human subject synovia did not exist as a fluid except in disease.—Mr. SANTY replied in the affirmative.

Mr. HOWARD stated that he had used a pitch plaster with long tow in cases of Bog Spavin, with favourable results, and he had sometimes succeeded in removing Thorough-pin with a truss. In two instances he had also cured the latter by puncturing the sac, and he should be glad to hear Professor Pritchard's views as to the latter mode of treatment,—who replied that he was not in favour of the practice, which was usually attended with unsatisfactory results.

Mr. WHINCOP strongly advised the use of long and narrow starch bandages, and when quite dry a flocking to be placed over them; also enjoining rest and quiet in a loose box in cases of Thorough-pin and bursal enlargements, especially in cases of Windgall; and in reply to a question from Mr. Santy stated that they did not produce excoriation or inconvenience. In a few instances the enlargement returned with work, but generally the cure was permanent.

Mr. GOOCH enquired if any gentleman present had used the pneumatic aspirator to remove fluid from serous sacs, and if so, with what results.

Mr. LOW replied that he had experimented on a horse of his own, which had a very large serous sac in front of the knees: the fluid was easily removed, but it would fill again. At length he fully opened the sac, which produced severe irritation, followed by inflammatory action, and ended by causing the horse's death.

Mr. OVERED, in proposing a vote of thanks to the essayist for his valuable paper, with a request that it might be published in the professional journals (which was seconded by Mr. AUGUR and carried with acclamation), took occasion to express the pleasure with which he witnessed the resuscitation of the Norfolk and Eastern Counties Veterinary Medical Association, which, although not actually dead, had been in a very long and deep sleep; but, thanks to Mr. Santy and a few other friends, their efforts to rouse the Society and restore its animation had been fairly successful, of which they had proof in the meeting of to-day, and which he hoped was an augury that a long period of usefulness was before them. He trusted it would be the means of uniting in one strong and compact body the scattered members of the profession in this part of the kingdom, and whilst promoting a more kindly feeling of mutual trust and confidence towards each other, also produce greater unanimity of opinion on all matters connected with their professional interests, and especially on the vexed question of examinations as to soundness. They were much indebted to Professor Pritchard for his kindness in being present—which was the first time such an honour had been paid them—and for his valuable remarks on a somewhat obscure subject: he trusted that at no distant day they might again be privileged to welcome the Professor in their midst, whose presence, he was sure, would always be hailed with pleasure and satisfaction.

A hearty vote of thanks was then accorded to the Professor, who briefly replied; and a similar compliment to the chairman concluded the meeting.

J. D. OVERED, *Hon. Sec.*

ROYAL AGRICULTURAL SOCIETY.

AT the monthly council meeting, held on July 3rd, the Hon. W. EGERTON, M.P. (chairman), reported that the Committee had received Mr. Duguid's statements as to the number of applications for advice made by members of the Society during the half-year ended June 24th. Since the end of the half-year Mr. Duguid had reported as follows in reference to an outbreak of Diarrhœa amongst lambs on the farm of Mr. Stonham, Aldington, Thurnham, near Maidstone, who attributed it to their feeding on certain grasses, a sample of which had been sent to the Consulting Botanist:—

"At Mr. Stonham's request I visited his farm on May 22nd, and found nearly the whole of his lambs, 140 in number, suffering from a severe form of Diarrhœa. The lambs were weaned on April 6th, and did well up to the beginning of May. I made a *post-mortem* of two that were in a dying state at the time of my visit, but failed to make out the cause of the mischief. I advised a change of food, and they were removed from the field in which they had been grazing. Mr. Stonham at first thought they were suffering from Typhoid Fever, but on finding a quantity of *Lolium temulentum* appearing in the field, he considers that to have produced the Diarrhœa. The lambs are now doing better: thirty have died, and ten more not expected to recover. The remaining 100, Mr. Stonham writes, are doing well."

Mr. DUGUID also reported in reference to the experiments now being carried out at the Brown Institution, as follows: "The first series of Pleuro-

pneumonia experiments were completed by March 1st, 1878. Of the nine animals inoculated, one died from other causes soon after the inoculation, and the other eight were exposed to the contagion by cohabitation with diseased animals, as has already been reported to the Society. Of these two were sold to a butcher, and the lungs examined and found healthy. Four more were sold after being kept under observation for nearly three months after the exposure to the contagion. One was killed on account of diseased liver and injuries inflicted on stomach and lungs by a surgical needle accidentally swallowed with the food. One animal was exchanged for another, to commence a series of observations on Anthrax. In May four yearling heifers were purchased for £27, and further experiments on Anthrax and Pleuro-pneumonia are now in progress."

This report having been adopted,

The Earl of POWIS called attention to the statements which had been made in the newspapers in reference to the extraordinary mortality amongst the deer in Cassiobury Park, and asked as to whether any light could be thrown upon its cause.

Dr. VOELCKER thereupon stated that he had received some samples of water from a park in Kent, where large numbers of deer had also died, and the mischief had been attributed to impurities in the water; but on examination he found nothing in the samples sent to him to justify this inference. He was rather disposed to attribute the mortality amongst the sheep which had been reported upon to the effect of the succulent grass, which was the result of a rapid growth in spring, after previous heavy rains.

Mr. RAWLENCE corroborated Dr. Voelcker's views with regard to the effect of such rapidly-grown grass upon sheep, and quoted instances derived from his experience of the management of over four thousand sheep annually. The mortality amongst them this year was excessive, and was caused chiefly by Diarrhœa brought on by too succulent food; and his neighbours' experience was the same as his own.

Professor SIMONDS also endorsed Dr. Voelcker's statement as to the effect of unripe grass upon sheep in producing Diarrhœa, and consequently great mortality; but the deer to which Lord Powis had alluded were supposed to have been bitten by dogs, and to have died of Rabies. He had not found, however, any ground to sustain this belief; and whatever the precise nature of the disease should turn out to be, he could at present only say that it was a disease of the brain and of the nervous system generally. In the same park as the deer a flock of sheep had been kept, amongst which great mortality had occurred, so that at present only thirty or forty were left out of the original number of 250 ewes. One of these sheep had been examined at the Royal Veterinary College. It arrived in a state of extreme emaciation, and died shortly afterwards. A *post-mortem* examination showed that the true stomach was infested with parasites in myriads. He predicted this as soon as he saw the animal, before the *post-mortem* commenced, as he had many years ago directed attention to this particular disease. He quoted cases which had been brought before him originally and in which the *post-mortem* examination showed no disease in the vital organs whatever, except inside the true stomach, where these parasites, which are called *Strongylus contortus*, were attached by their heads to the mucous membrane of the stomach as thickly as the hairs upon one's head. Subsequently other cases were brought to his notice, both in lambs and sheep, which had been fed in all ways; but the preponderance of cases arose from those which had been fed partly on grass and partly on turnips. The late Mr. Jonas Webb had, however, asked him him to inspect, on a chalk-land farm, a flock of sheep supposed to be suffering from Rot, and which rarely, if ever, went on natural grass. He found that this affection was the same as that he had been

alluding to; and on making a *post-mortem* examination of one of them it occurred to him to try the effect of salt on the parasites in the stomach. A strong solution killed them instantly; so he took the hint, and administered salt to the diseased animals with very good effect. This disease had all the appearance of Fluke-rot, but with this difference—that the sheep attacked by it never have Diarrhœa, but are always constipated. The salt should be administered in the form of table-salt and water with the food at every meal, and the animals should have a quarter of an ounce of salt per head per day. He feared that the disease had been prevalent too long among the Essex sheep to leave them sufficiently strong to recover under any treatment.

In answer to Mr. PAIN, with regard to the large number of mares which had this season slipped their foals,

Professor SIMONDS stated that he believed this peculiarity to be due to the character of the food of the mares, which had set up Rheumatismal Inflammation.

Mr. ROBERT RUSSELL expressed his opinion that the losses of sheep from Diarrhœa were due to the animals not having a sufficient amount of dry food, for, owing to the high price of hay, farmers had sold as much of that feeding material as possible. In his case he might say that his sheep had never done so well as during this season.

Mr. WHITEHEAD corroborated Mr. Russell, and expressed the hope that the investigation into the character of the grasses alluded to in the report should not be allowed to drop. His own opinion was that something more than rank grass must have been present to cause the mortality which had been described in the report.

Jurisprudence.

THE GREAT HORSE CASE.

COCK v. ATTWOOD.

AT the Truro County Court, on March 17th, before Mr. Montagu Bere, Q.C., judge, his Honour gave judgment in this case, which was tried at the previous court without a jury.

He said Mr. F. Hearle Cock, a solicitor, practising in this city, was the plaintiff, and the Rev. Francis Attwood, a clergyman, having a lectureship, and residing at Torquay, was the defendant. The action was brought to recover £50 (excess having been abandoned), alleged damages ensuing to the plaintiff in consequence of the breach of warranty given by the defendant on the sale and purchase of a horse in November last. The plaintiff having seen an advertisement in the *Western Morning News*—"For sale, handsome bay gelding, 15·2, rising six, no vice, sound, good in harness and saddle—Rev. S. Attwood, Stockleigh, Torquay"—wrote to defendant on November 8th respecting the horse. The defendant replied in a letter which one of the witnesses described as a "glorified" description of the horse, and also a warranty of soundness, if the recollection of plaintiff and Mr. Olver was to be relied on, though that recollection was opposed to the defendant's two witnesses, Mr. Williams and Mr. Burton. Plaintiff, on the recommendation of Mr. Olver, employed Mr. Williams, a veterinary surgeon at Newton Abbot, to examine the horse and report, sending to him the letter of defendant of November 9th, which, unfortunately, Mr. Williams afterwards destroyed. Williams examined, rode and drove the horse on November 14th, and reported

very satisfactorily as to his steadiness and soundness. The plaintiff accordingly wrote to defendant a letter dated November 16th, in which he offered to buy the horse at the price asked by defendant, defendant freeing it to the station at Perranwell. That offer was not then accepted by defendant, who, however, intimated that on receipt of plaintiff's cheque he would send the horse on to Williams, and would free him to Perranwell. The cheque arrived on the 21st, and a receipt and warranty of being quiet to ride and drive was sent to plaintiff. The horse was taken from defendant's stables, on the afternoon of that day, by a man in the employment of Williams, and whose expenses were afterwards paid by plaintiff; remained the night at Newton, was put into a horse-box on the following morning, and arrived in the course of the 22nd at Perranwell. The horse was observed to stand oddly on his hind-legs as he came out of the horse-box, and this peculiarity was afterwards observed both by the plaintiff and his groom. The horse was driven on the Tuesday (26th), and showed, evidently, a great want of power; and also on the Thursday (28th), when similar weakness was evinced; and, on his being whipped to make him use greater exertions, he kicked and broke both shafts of the dog-cart. The plaintiff immediately wrote to defendant to ask him to take the horse back. The defendant refused, and eventually the horse was sold by auction, at a loss to the plaintiff of the sum which he sought now to recover. There were three questions to be asked and answered in this case—(1) Did the defendant warrant the horse sound and quiet to ride and drive? (2) Was the horse unsound? (3) When did that unsoundness begin—while it was the property of defendant, or after it became the property by purchase of the plaintiff? He was of opinion that the defendant, in his letter of the 9th November, warranted the horse to be sound. The defendant had the highest opinion of the animal, and had never observed anything wrong with it; and in his strongly-worded letter of refusal to take it back, of November 30th, he never asserted that he did not give a warranty—an assertion he would have made if a warranty had not been given. He preferred the recollection of the plaintiff and his witnesses to the remembrance of the defendant and his witnesses. His opinion, however, as to a warranty of soundness was not material, as he was of opinion that the warranty of the horse being quiet to ride and drive, which was given in the receipt, was broken—the horse, from some cause or other, having shown that he was not quiet to ride and drive almost immediately after he came into the possession of the plaintiff. Was the horse unsound? There was not any difference of opinion on the subject, as all agreed that he was unsound when examined, and only disagreed as to the answer to be given to the third question—When did the unsoundness begin? The advocate for the defendant contended that the property in the horse passed to the plaintiff on the acceptance of his offer to purchase it, and that after such acceptance all risks were to be run by him. With a little modification he agreed with this contention. He thought that on November 20th, on the posting of the letter written by plaintiff enclosing cheque, the bargain was complete, and the property passed to the plaintiff, and with it all ordinary risks. He said the 20th, because the plaintiff's offer of the 16th was conditional on the horse being freed to Perranwell, and to that condition the defendant might have objected, who also by his letter of the 19th inserted another condition—namely, the sending of a cheque in payment. Now, at the time of the posting of that letter by the plaintiff, was the horse sound or unsound? His vice arose from his unsoundness; and if, therefore, the unsoundness existed, or the injury producing the unsoundness had been inflicted before the bargain was complete, the warranty had been broken, and the defendant was answerable for such breach. He might remark here that he considered that Williams was not authorised by the plaintiff to send

for the horse to Torquay, and that the delivery to Pigeon, and its being placed in the stable at Newton, was not a delivery and acceptance to satisfy the statute, though the careless conduct of the plaintiff, in paying the expenses of the man sent to Newton, might authorise such a conclusion. The property in the horse having passed, the risk passed also, unless the seller had undertaken to do any act which entailed a special risk on himself. If the horse had been burnt in the stable at Newton; if he had run away and injured himself in his transit from Torquay to Newton, or from the stables to the station, *us perit domino*, the plaintiff must have sustained the loss; but the defendant undertook to free the horse to Perranwell, and the question which he had asked himself, and to which he could give only a somewhat hesitating answer, was, Did not the defendant, by his undertaking, agree to deliver the horse in a sound condition at Perranwell? and if any accident actually flowing out of his undertaking to free the horse by railway occurred to the animal, and prevented the horse being delivered sound, was he not responsible? Risk and property were not inseparable. It might very well be that the property should be in one and the risk in another. He must acknowledge that he could not find any direct authority on the point he had raised. There were a number of cases in which the question as to the right person, consignor or consignee, to bring an action for loss or damage against the carrier, had been discussed; and the legal rule to be discovered from these cases seemed to be that when there was anything to be done before the property in goods passed from the seller to the purchaser, the consignor should bring the action, but that when the contract was complete, then the consignee became the proper plaintiff, even though the consignor had undertaken to pay the carriage. These cases, however, did not seem to him to settle the rights as between vendor and vendee, in cases where the vendor, having undertaken to deliver and pay carriage, the article carried was delivered in a damaged condition. Justice, common-sense, and, he believed, the usages of trade, seemed to him to point to the vendor as the person to sustain the loss, he having voluntarily taken upon himself the execution of an act in which there was an inherent and probable risk. The cases of Ward *v.* Shaw, and Jewry *v.* Walker, American cases, were somewhat against his view; but he should hold, though he had not a confident opinion, that he was right that the risk was in the vendor. If the risk during railway transit be in the vendor, then, in this case, if he believed all the evidence given on both sides, the defendant must be the sufferer, as, according to that evidence, the horse was sound at Newton, and unsound at Perranwell, and the injury must have happened during the railway journey, and while the risk of the defendant continued. Such was his opinion on the law applicable to this case; but, as he foresaw considerable litigation, he did not express his opinion on the facts, as a jury would do. He should proceed to give his opinion on the facts of the case as disclosed in evidence. He was of opinion, as matters of fact, that the defendant gave a warranty of soundness, that the horse was unsound, and that such unsoundness existed before it became the property of the plaintiff. He had already given his reasons for his opinion on the first two points, and would now explain how he was induced to arrive at his decision, as a juryman, on the third point. Very little assistance was rendered by the professional witnesses. The commencement of such an injury as this horse must have received—even its possible effects—must be a matter always of opinion; and the opinions of equally scientific veterinary surgeons contradicting each other were equally to be relied upon; still, they were mere opinions, and could not be satisfactorily tested. If he relied on such opinions to found his own determination upon, he should unhesitatingly prefer the open, straightforward evidence of Mr. Olver, who declared the disease

of long standing, to the somewhat uncertain and vague expressions of belief made by Mr. Williams and Mr. Burton, that the injury was very recent: in the case of Mr. Burton, twenty-four hours before. The two former, and most of the humbler witnesses for the defence, showed a bias and partiality for the side on which they were called, which rendered their evidence to his mind wholly trustworthy. The statements made by witnesses who could not detect on the day of trial that the horse was changed in appearance or soundness from what he had been when they had seen him before, came from such unknowing or fraudulently-minded people as not to be of any weight with him. The conduct of Mr. Williams had been, to his mind, very suspicious. Williams received a telegraphic message on December 12th, asking for Mr. Attwood's letter of November 9th, and he replied by asserting that he had burnt it the night before. Very odd conduct, to say the least of it. He was written to by Mr. Olver, on December 13th, who inquired whether he had observed anything peculiar in the hind action of the horse; and he replied on the 14th December that he declined making any remarks, "as if litigation should occur it might not be so pleasant." From whom had he learnt that litigation was possible? Either from defendant or his solicitor. If he had not observed anything peculiar, why not plainly say he had not? He (his Honour) had a very strong opinion of the conduct of Mr. Williams in this matter. He would merely say that he could not trust him. The history of the horse was peculiar. He was bought by defendant in February, 1877, for £84. He was offered for sale at Cheltenham, with a reserve price of £73. His former owner bid only £50 for this valuable and sound animal. He was sent down at additional expense to Torquay, and then his owner asked and obtained only £65 for him. It might be that there was that known about him in Gloucestershire which made a sale there difficult. He (his Honour) drew conclusions from defendant's letter of November 30th, which were not favourable to this case. There was a bluster and big-wordedness about it which seemed to him to be put on to prevent betrayal of some concealed fear or suspicion about the horse. There was one false statement in it. The horse had been in defendant's possession eight months only, and yet defendant stated that he had experience of him by more than a year's trial. The defendant did not deny that the horse did not stand fully on his hind-legs, but intimated that he "cannot say whether he does or not." Defendant was not an ordinary master of a horse, as he had groomed the horse himself for some time, and yet could not tell how he stood on his hind-legs. He could not quite reconcile the opinion entertained by the defendant of veterinary surgeons as persons open to bribery and corruption—expressed, as defendant himself admitted, before the examination took place—and his confident reliance upon one of these persons when the examination turned out favourable to himself. The shoes of the horse were unusual: the toes were worn thin, while the heels were comparatively unworn, justifying Mr. Olver's opinion that the disease had been of long standing. It was true that the shoes were old ones, but that fact rendered the non-wear of the heel still more remarkable than it would have been with new ones. The assertion of the Torquay blacksmith, that half an inch had been worn down, only convinced him of his ignorance and his determined partisanship. It might be urged that the injury took place in the train between Newton and Perranwell. He did not believe it did, as the horse was cool, did not exhibit any signs of fright, nor did the horse-box show any marks to indicate that he had kicked, or had been restive. The horse was not unaccustomed to the train, as he had been trained down from Cheltenham to Torquay—a somewhat longer journey than from Newton to Perranwell. He thought, as a juryman, that the injury was, to a certain extent, latent. It did not show itself when the horse was ridden; and the

horse, according to defendant's statement, had not been driven for some days before the 22nd. It might, therefore, have occurred even after the examination by Williams, on the 14th inst., and remained comparatively undeveloped till the animal was again tried in harness. Its existence, therefore, might have been unknown to the defendant and his boy. On the view of the whole of this case, comparing the two sets of witnesses, their assertions, and their demeanour in the witness-box, he had come to the conclusion that the horse was unsound when sold to plaintiff, and a verdict must be entered for the plaintiff, with costs.

Obituary.

WE regret to announce the death of Mr. William Smith, F.R.C.V.S., of Norwich, on July 4th, aged 61 years. Mr. Smith graduated in 1837, and practised his profession in Norwich for many years, gaining the respect and esteem of his fellow-townsmen, among whom he occupied a worthy position. He lately filled the office of Vice-President of the Royal College of Veterinary Surgeons, and was one of its foundation Fellows, in whose ranks his death causes the first vacancy. None could be more interested in the welfare of the profession than our deceased colleague, and few were more anxious to promote its well-being. We can ill afford to lose such men at any time; at present their departure from among us almost amounts to a calamity.

The following deaths are also reported :—Mr. J. Yates, late of Barrow-in-Furness, who graduated in 1870; Mr. J. Miscamble, Melbourne, Australia, who graduated in 1845; Mr. W. Elam, Liverpool, who graduated in 1846.

Army Veterinary Department.

Gazette, July 12.

ROYAL ARTILLERY.—The undermentioned Veterinary Surgeons, from the Veterinary Department, to be Veterinary Surgeons :—H. Thomson, vice S. Longhurst, transferred to the 1st Dragoon Guards; H. Batchelor, vice J. Findlay, transferred to the 6th Dragoons.

VETERINARY DEPARTMENT.—The undermentioned Gentlemen to be Veterinary Surgeons :—W. D. Gunn, S. W. J. Slattery, and W. R. Hagger.

First Class-Veterinary Surg. G. A. Oliphant, 5th Brigade, in veterinary charge of the Reserve Remount Depôt, Hapur, has been granted leave from India to England for eighteen months, on private affairs. Veterinary-Surg. J. Mills, R.H.A., has passed the lower standard examination in Hindostanee.

Parliamentary Intelligence.

HOUSE OF COMMONS—JULY 15TH.

Inoculation for Pleuro-pneumonia.

SIR P. O'BRIEN asked the Secretary to the Treasury whether his attention had been directed to the success attendant upon the inoculation of cattle at Campbeltown in Argyllshire, and elsewhere, in preventing the spread of

Pleuro-pneumonia; and whether he would consider the expediency of introducing a clause in the Cattle Bill, rendering such inoculation compulsory.

Sir SELWIN-IBBETSON stated that the plan of inoculating cattle had been tried for many years in all parts of the world; and although in some instances it had proved successful, it had not been such as to lead to any certainty in reference to its results. The Government were not prepared, therefore, to introduce any clauses into the Contagious Diseases (Animals) Bill making the operation compulsory.

Notes and News.

ROYAL VETERINARY COLLEGE.—The following startling announcement appeared in the *Daily Chronicle* of July 6th. "Yesterday forenoon the annual meeting of the governors and subscribers to this College, situated in Great College Street, Camden Town, was held at the Board-room, when the annual report was presented. It stated that the College continued to be successfully managed under Professor Williams, and that the number of students attending the classes was quite equal to that of former years. The funds of the College were also in a prosperous condition. The meeting then proceeded to consider the report and the affairs generally of the College in private, but it was understood that the governors were well satisfied with the conduct of the College."

GERMAN AND FRENCH VETERINARY SCHOOLS.—The office of Director of the Veterinary College at Berlin, vacant by the lamented death of Professor Gerlach, has been filled, as anticipated, by the appointment of Dr. Roloff, of the Sanitary Department, formerly a Professor at the University of Halle.

Professor Lafosse, who was appointed Director of the Toulouse Veterinary School, has resigned the appointment after holding it for only five months, and claimed retirement. He is replaced in the Directorship by Professor Baillet, of Alfort, well known as a veterinary helminthologist.

RABIES AND HYDROPHOBIA.—The Holker harriers have been visited by Rabies, and nearly the whole pack has been destroyed. Eight had to be killed some time ago, and more recently twenty-five had to be slaughtered, leaving only five of this pack—one of the oldest in England. The Marquis of Hartington, to whom the pack belongs, has decided to abandon it, much to the regret of the lovers of the chase in the district. Now that twenty of Mr. Kennedy's pack of beagles have had to be destroyed for a similar reason, the hunting associations of Furness will become a thing of the past, the only pack now remaining being the Coniston foxhounds.

DR. DIPLOCK held an inquest on July 4th, at the Osborne Castle, Acton, touching the death of George Kirby, aged 14, the brother of a publican at Acton. The evidence showed that a month ago the deceased was playing with a Scotch terrier, when the animal bit him, or rather scratched his hand with his teeth. The abrasion did not heal, but no notice was taken of it until last week, when the deceased complained of illness, and upon a doctor being summoned he pronounced the case to be one of Hydrophobia. Convulsions came on of such a violent character that two powerful men had the greatest difficulty in holding him, and all attempts to administer chloroform were abortive. His agonies increased, and after three days' suffering he died.—Dr. Harding said that before death the veins of the arm bitten by the dog stood out prominently, the eyes were contracted, and the deceased was unable to swallow.—Mary Hynes stated that she had been bitten by the same dog, but had as yet had no symptoms of Hydrophobia.—In reply to a

juror it was elicited that the dog had been examined by a veterinary surgeon, who had prononnced it to be perfectly healthy, and it had not therefore been destroyed. The juror expressed his opinion that it should be killed forthwith, but the coroner had no power to order its destruction.—A verdict of "Death from Hydrophobia" was recorded. From a communication in the *Lancet*, it would appear that there can scarcely be any doubt that the disease was Hydrophobia, and there is evidence that the dog was alive and well when the patient died.

TRANSMISSION OF PHYSICAL TRAITS.—M. Lenglen, a physician, of Arras has recently described a remarkable perpetuation of physical traits. A certain M. Gamelon, in the last century, was sex-digital, having two thumbs on each hand and two great toes on each foot. The peculiarity was not noticeable in his son, but in each of three subsequent generations it has been strongly marked—some of the children at present showing the malformation as distinctly as their great-great-grandfather. M. de Quatrefages has noticed, a few months since, a similar case in the animal kingdom. A six-toed cock having transmitted this peculiarity to his descendants, it has spread to such a degree, that in the district where it occurred the ordinary five-toed variety is no more to be met with.—*Nature.*

EDUCATION IN THE FRENCH VETERINARY SCHOOLS.—By a decree of the French Minister of Agriculture and Commerce, issued in April last, the course of instruction in the Veterinary Schools of the Republic will henceforth be distributed among eight chairs, as indicated below:—*1st Chair*—Of anatomy: General anatomy and histology, descriptive and comparative anatomy, the exterior of the horse, teratology. *2nd Chair*—Of physiology: General physiology, special physiology of various animals, general therapeutics. *3rd Chair*—Of physics, chemistry and pharmacy: Physics as applied to physiology, chemistry, pharmacy, toxicology. *4th Chair*—Of pathology of contagious diseases: Pathology of contagious diseases in different species, sanitary police as applicable to such diseases, commercial legislation, medical jurisprudence, inspection of butchers' meat. *5th Chair*—Of general pathology: General pathology, medical pathology of domestic animals, parasitic diseases etiologically considered, symptomatology and therapeutics, general pathological anatomy, clinical medicine. *6th Chair*—Of surgical pathology: Surgical pathology, obstetrics, operative surgery and regional anatomy, farriery, clinical surgery. *7th Chair*—Of natural history: General zoology, special zoology, botany, materia medica. *8th Chair*—Of hygiene, etc.: Agriculture in relation to animal production, general and special hygiene, general zootechny, special zootechny.

GLANDERS AND ANIMAL DISEASES IN AMERICA.—Glanders and Farcy would appear to be on the increase in the State of New York, as they are in England. A Bill for the suppression of these loathsome diseases has passed both branches of the New York State Legislature. It is entitled an "Act relating to Diseased Animals," and is as follows:—"Section 1. Any person who shall knowingly sell or offer for sale, or use or expose, or who shall cause or procure to be sold or offered for sale, or used, or to be exposed, any horse or other animal having the disease known as Glanders or Farcy, or any other contagious or infectious disease by such person known to be dangerous to human life, or which shall be diseased past recovery, shall be guilty of a misdemeanour. Section 2. Every animal having Glanders or Farcy shall at once be deprived of life by the owner or person having charge thereof, upon discovery or knowledge of its condition; and any such owner or person omitting or refusing to comply with the provisions of this section shall be guilty of a misdemeanour."

ILLEGAL PRACTITIONERS.—Recently an unqualified law practitioner was prosecuted, *on behalf of the Crown*, by the Attorney-General, Solicitor-General, and a learned junior, before Baron Pollock, and fined £50. The Attorney-General observed that the result of the provision of the Act of Parliament was, "that every unqualified person who drew certain legal instruments incurred a penalty; and, in his opinion, the provision was a wise one, and necessary for the protection of properly qualified practitioners, as well as for the public. It was very hard upon a man who had gone through a long, a laborious, and an expensive training, and who had thereby duly qualified himself for the practice of the law, that he should be subject to the competition of those who were unqualified, and, as a rule, were quite unfit to undertake the conduct of legal matters; and it was for the interest of the public that their legal affairs should be transacted by duly qualified persons, who, in case of want of skill or negligence, were liable to an action, or were subject to the control of the courts." No incompetence appears to have been alleged against the defendant, the cost of whose prosecution has to be defrayed by the country.

We commend the above to the notice of those members of the veterinary profession who are anxious to protect themselves and the public from the injury inflicted by unqualified practitioners.

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from Captain Hayes, Bengal Staff Corps, Eastern Bengal; P. Beattie, Bogfern, Aberdeen; T. Hopkin, Manchester; H. M. Jenkins, London; W. Sartin, Royal Artillery, Burmah; A. H. Santy, Norwich; J. D. Overed, Blofield; J. Lambert, 17th Lancers; W. H. Coates, London.

BOOKS, PAMPHLETS, ETC.: Annual Announcement of the American Veterinary College; *Martin Wilckens*, Die Rinderrassen Mittel-Europas; *Carl Bräur*, Sammlung von Gestüts-Brandzeichen; *A. Voelcker*, Annual Report of the Consulting Chemist for 1877, On Bats' Guano, Report of Field and Feeding Experiments conducted at Woburn; Report of the Home for Lost and Starving Dogs; Referat betref. die Verbreitung der Ansteckenden Thierkrankheiten; *A. H. Santy*, Anatomy and Diseases of the Hock Joint of the Horse; *G. G. Richardson*, The Corn and Cattle Producing Districts of France; Report of Meeting regarding Slaughtering of Cattle.

JOURNALS: *Oesterreichische Vierteljahresschrift für Wissenschaftliche Veterinärkunde; Annales de Médecine Vétérinaire de Bruxelles; Archiv. für Wissenschaftliche und Practische Thierheilkunde; Revue Vétérinaire; Wochenschrift für Thierheilkunde und Viehzucht; Farmer; Recueil de Méd. Vétérinaire; Mark Lane Express; Journal de Méd. Vétérinaire et de Zootechnie; Medical Press and Circular; Archives Vétérinaires; North British Agriculturist; Agricultural Gazette; Live Stock Journal; Army and Navy Gazette; Der Thierarzt; Broad Arrow; Journal of the National Agricultural Society of Victoria; Journal of the Anthropological Institute.*

NEWSPAPERS: *Globe; Scotsman; Home Chronicle; Manchester Evening Mail; Norfolk Chronicle and Norwich Gazette; Pall Mall Gazette; Observer; Manchester Guardian; Stirling Reporter.*

All Communications, Books for Review, Advertisements, etc., must be addressed to the Publisher, 20, King William Street, Strand, W.C.

Morbid Specimens are to be forwarded addressed to the Editor, "Veterinary Journal" Brown Institution, Wandsworth Road, London.

Communications must be accompanied by the name of the writer, whether he may desire to have it published or not. Anonymous letters and articles cannot be inserted. The Editor does not hold himself identified with the views or opinions expressed by Contributors. Communications for insertion in the next number must arrive on or before the 15th of the present month.

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